# 𝕷ist of 𝕻atterns, &c.

BELONGING TO THE

# SOUTH-BOSTON IRON COMPANY;

## CYRUS ALGER AND OTHERS,

𝔓roprietors.

REVISED AND CORRECTED, WITH ADDITIONS MADE, TO MARCH 1, 1858.

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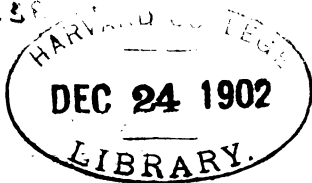FOUNDRY AND MACHINE-SHOP, — SOUTH BOSTON.

OFFICE, — HEAD OF CENTRAL WHARF.

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## BOSTON:

☞ In all orders by letter for Geers or Pulleys, be
pleased to copy the dimensions entire from the Pattern
Book, and remember to give the sizes of holes to be
cast or bored.

# SOUTH-BOSTON IRON COMPANY.

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THE SOUTH-BOSTON IRON COMPANY is pre-
pared to furnish CASTINGS of every description,
at the shortest notice, and on the most favorable
terms.

Their large stock of Patterns comprises a
general assortment of Geering, Pulleys, Hang-
ers, Pillow Blocks, Flanches, Spiders, Gudgeons,
Cranks, Shafts, and Couplings; together with a
great variety of miscellaneous patterns adapted
to the wants of Machinists, Millwrights, Manu-
facturers, &c.

They are prepared to furnish all new patterns
that may be required, at a reasonable cost; their
facilities and experience in this department being
unsurpassed by any other establishment.

Particular attention will be given to the manufacture of Steam Engine Castings, Hydrostatic Presses, Stills for the distillation of Pine or Resin Oil, Chilled and Dry Sand Rolls, Bark Mills, Plaster Crackers, Sugar Mills, &c.

Large Kettles, from 100 to 1500 gallons, and of any form required, made at short notice; also Curbs for the same, for the use of Soap Boilers and others. Sugar Pans and Oil Kettles, of all sizes; also Kettles for calcining plaster, of 160 gallons, cast bottom down. Cylinders for Paper Manufacturers, Powder Works, or any other purpose, of any size that may be wanted, from one foot to fifteen feet in diameter. An assortment of Soap Kettles, &c., usually kept on hand.

They have also a Machine Shop attached to the Foundry, where all kinds of Boring and Turning, including wrought iron and blacksmith's work, are executed with promptness. When desired, estimates are furnished for heavy machinery for Rolling Mills, and the same furnished and set up in the best manner.

For expensive and heavy Shafts, Cranks,

Presses, Rolls, Hammers, Dies, and a great
variety of other Castings, it is often very de-
sirable to secure an extra quality of iron. When
desired, these are made of "gun-metal," at a small
additional cost, with the advantage of nearly
double the strength of ordinary castings.

They would call the attention of Iron Manu-
facturers to James Watt's Patent Steam Forge
Hammers, comprising 500 lbs., 1,500 lbs., 2,000
lbs., and 3,000 lbs. weight of hammer. These
have been proved superior to all other hammers,
in point of economy of cost, and power; and
are superseding all others for the manufacture
of Railroad Work, Shafts, and indeed all kinds of
forging within their capability. They are con-
structed in the most thorough manner, and fur-
nished so complete as to require only a proper
foundation and connection with the steam-boilers
to be put into immediate operation.

Composition Castings and Bronze Cannon will
be furnished at short notice. These guns, in-
tended for Merchantmen or Steamers to give
notice of arrival or departure, as well as for

defence if occasion should require, are of various calibers, — usually 4, 6, 9, and 12 pounders. They are attached to carriages; and are furnished with percussion-locks, and all the usual equipments for service.

Iron Cannon of various calibers, with Carriages for the same, designed for ships or fortifications, including Shot, Shell, Shrapnell, Canister, Grapeshot, Percussion Caps, Fuses, &c., will be supplied at short notice.

The late Cyrus Alger, who for many years was the senior member of this firm, made many improvements in the metallurgy of iron; and, by a process suggested and manipulated by himself, was enabled to increase the strength of certain kinds of pig-iron, from its normal tenacity of 12,000 lbs. to the square inch, to that of 35,000 lbs., — thus particularly adapting it to the fabrication of Cannon, as well as for machinery requiring great strength. When, therefore, we may be requested to furnish "gun-metal," the applicant will readily understand what he is to receive; and he may feel safe in substituting

this iron, in many cases, in place of wrought
iron: for, if a comparison may be drawn between
its capability of resisting instantaneous shocks,
and its power of withstanding a gradual strain or
tension, Steamboat and other heavy Shafting,
Cranks, &c., may be made from iron thus pre-
pared; as it is well known that the heavy
wrought-iron guns made to supersede those of
cast-iron failed to maintain an equal amount
of endurance, on a fair comparison of the respec-
tive weight of each. It may not be amiss to
state, that the *first* of the large cannon of 10, 11,
and 12 inch caliber, made by order of the United-
States Government for the Army and Navy, were
cast at this establishment, under the immediate
direction of Mr. Alger, and from iron of his own
selection, and prepared by his own process.
One of these guns, of 11 inches caliber, carry-
ing a solid shot of 170 lbs., or a shell of 135 lbs.,
was first fired six hundred and fifty-five times
with the former projectile, and thirteen hundred
and six times with the latter, — an enormous
endurance of nineteen hundred and fifty-nine

rounds before it failed, — far exceeding any other gun of equal size of which any knowledge has come to us from the Ordnance Reports of this or any other country. Com. Dahlgren well said of this gun, " that it had shown all that could be required of it, and very much more."

A constant supply of the following articles, among many others, kept on hand : —

| | |
|---|---|
| Potash Kettles | Basket Grates |
| Caldrons, 15 to 75 galls. | Cesspools |
| Bark Mills | Travellers |
| Corn Crackers | Grindstone Cranks |
| Door Scrapers | Friction Rollers for do. |
| Hawser Pipes | Hoisting Wheels and Pinions |
| Chain Deck Pipes | |
| Stove Deck Pipes | Lathe Wheels |
| Tire Benders | Lathe Puppets |
| Forge Backs | Rests and T's for do. |
| Oven Doors | Windlass Boxes |
| Ash Doors | Truck Wheels |
| Boiler Doors | Dumb Bells |
| Do. Grates | Wing Gudgeons |
| Grate Bars, 12 to 36 inches | Saw Mill Cranks |
| Cylinder Stoves | Fulling Mill do. |
| Frames and Grates | Rollers for Doors |

Barrow's celebrated Cooking Ranges, three sizes, constantly on hand.

| No. | Diameter. | | Pitch. | No. Cogs. | Length of Cogs. |
|---|---|---|---|---|---|
| | Ft. | In. | Inches. | | Inches. |
| 536 | 5 | | 4 | 47 | 12 |
| 537 | 3 | $\frac{1}{2}$ | ,, | 29 | 12 |
| 538 | 6 | | ,, | 57 | 12 |
| 539 | 4 | 6 | $3\frac{5}{8}$ | 48 | 8 |
| 589 | 2 | $3\frac{3}{4}$ | ,, | 24 | 7 |
| 540 | 6 | $8\frac{3}{4}$ | $3\frac{1}{2}$ | 72 | 10 |
| 541 | 2 | $10\frac{1}{2}$ | ,, | 31 | $7\frac{1}{2}$ |

| No. | Diameter. | | Pitch. | No. Cogs. | Length of Cogs. | |
|---|---|---|---|---|---|---|
| | Ft. | In. | Inches. | | Inches. | |
| 483 | 21 | $7\frac{1}{2}$ | $3\frac{1}{4}$ | 256 | 9 | 16 segmt. |
| 484 | 10 | | ,, | 117 | 9 | |
| 542 | 6 | 6 | ,, | 76 | 9 | |
| 543 | 5 | 5 | ,, | 63 | 10 | |
| 544 | 4 | $4\frac{1}{8}$ | ,, | 50 | 9 | |
| 545 | 3 | $7\frac{1}{2}$ | ,, | 42 | 9 | |
| 546 | 3 | $4\frac{1}{2}$ | ,, | 39 | 10 | |
| 485 | 2 | $11\frac{3}{4}$ | ,, | 35 | 9 | |
| 547 | 2 | $8\frac{1}{2}$ | ,, | 31 | 10 | |
| 548 | 2 | $3\frac{3}{8}$ | ,, | 26 | 9 | |
| 482 | 1 | $7\frac{3}{4}$ | ,, | 19 | 9 | |
| 635 | 1 | $\frac{3}{4}$ | ,, | 12 | $9\frac{5}{8}$ | |

| No. | Diameter. | | Pitch. | No. Cogs. | Length of Cogs. |
|---|---|---|---|---|---|
| | Ft. | In. | Inches. | | Inches. |
| 223 | 2 | | $3\frac{1}{8}$ | 24 | $7\frac{1}{2}$ |
| 218 | 1 | $10\frac{3}{8}$ | ,, | 22 | $3\frac{5}{8}$ |
| 224 | | $10\frac{1}{2}$ | ,, | 11 | $7\frac{1}{2}$ |
| 657 | 2 | 2 | 3 | 27 | 7 |
| 621 | 3 | $5\frac{1}{8}$ | ,, | 43 | 6 |
| 220 | 3 | 1 | ,, | 39 | $5\frac{1}{2}$ |
| 221 | 2 | $9\frac{1}{4}$ | ,, | 35 | $5\frac{1}{2}$ |
| 550 | 2 | $7\frac{5}{8}$ | ,, | 33 | 6 |
| 442 | 2 | 4 | ,, | 29 | $5\frac{1}{2}$ |
| 222 | 2 | $1\frac{5}{8}$ | ,, | 27 | $5\frac{1}{2}$ |
| 193 | 1 | $10\frac{3}{4}$ | ,, | 24 | $6\frac{1}{4}$ |
| 551 | 6 | $4\frac{1}{2}$ | ,, | 80 | $4\frac{1}{2}$ |
| 552 | 3 | $5\frac{1}{2}$ | ,, | 44 | $3\frac{1}{2}$ mortise. |

| No. | Diameter | | Pitch. | No. Cogs. | Length of Cogs. | |
|---|---|---|---|---|---|---|
| | Ft. | In. | Inches. | | Inches. | |
| 1 | 20 | | $2\frac{7}{8}$ | 220 | 7 | 24 segmt. |
| 2 | 5 | $11\frac{5}{8}$ | ,, | 78 | 7 | |
| 3 | 2 | $11\frac{1}{2}$ | ,, | 39 | 7 | |
| 4 | 2 | $4\frac{3}{8}$ | ,, | 31 | 7 | |
| 5 | 20 | | ,, | 220 | 6 | 24 segmt. |
| 6 | 4 | $1\frac{3}{4}$ | ,, | 54 | 5 | mortise. |
| 27 | 24 | $4\frac{1}{2}$ | ,, | 323 | 7 | { 11 segmt. 14 cogs. / 13 do. 13 do. |
| 486 | 1 | $6\frac{3}{8}$ | ,, | 20 | 7 | |
| 554 | 1 | $5\frac{1}{2}$ | ,, | 19 | 7 | |
| 7 | 6 | $6\frac{3}{4}$ | $2\frac{13}{16}$ | 88 | $6\frac{3}{8}$ | |
| 8 | 3 | | ,, | 40 | $6\frac{3}{8}$ | |
| 9 | 2 | $\frac{1}{4}$ | ,, | 27 | $6\frac{1}{2}$ | |
| 10 | 1 | $6\frac{7}{8}$ | ,, | 21 | $6\frac{3}{8}$ | |
| 11 | 1 | $5\frac{3}{16}$ | ,, | 19 | $6\frac{3}{8}$ | |
| 12 | 10 | 8 | ,, | 144 | 6 | 16 segmt. |

| No. | Diameter. | | Pitch. | No. Cogs. | Length of Cogs. | |
|---|---|---|---|---|---|---|
| | Ft. | In. | Inches. | | Inches. | |
| 13 | 6 | 6⅝ | 2 13/16 | 88 | 5 | mortise. |
| 453 | 10 | | ,, | 137 | 6½ | { 5 segmt. 12 cogs. / 7 do. 11 do. |
| 660 | 24 | 2 | 2¾ | 340 | 8 | 20 segmt. |
| 636 | 2 | ⅜ | ,, | 28 | 8 | |
| 74 | 19 | | ,, | 360 | 8 | 20 segmt. |
| 18 | 12 | | ,, | 165 | 7½ | 15 segmt. |
| 16 | 9 | 8 | ,, | 132 | 8 | 12 segmt. |
| 17 | 4 | 7¾ | ,, | 64 | 8 | |
| 555 | 4 | | ,, | 54 | 6¼ | |
| 75 | 2 | | ,, | 27 | 8 | |
| 21 | 1 | 11¾ | ,, | 27 | 7⅜ | |
| 73 | 1 | 10 | ,, | 25 | 6 | |
| 22 | 1 | 9¼ | ,, | 24 | 6 | |
| 15 | 1 | 8 | ,, | 23 | 4¼ | |
| 556 | 1 | 5¾ | ,, | 20 | 7 | { To run with mortise. |
| 487 | 1 | 1½ | ,, | 14 | 8½ | |

| No. | Diameter. | | Pitch. | No. Cogs. | Length of Cogs. |
|---|---|---|---|---|---|
| | Ft. | In. | Inches. | | Inches. |
| 25 | 1 | $\frac{1}{2}$ | $2\frac{3}{4}$ | 14 | $4\frac{3}{4}$ |
| 557 | 2 | $9\frac{3}{4}$ | ,, | 38 | 6 |
| 627 | 1 | 11 | ,, | 26 | 7 |
| 549 | 5 | $6\frac{3}{8}$ | ,, | 76 | $5\frac{1}{4}$ mortise. |
| 26 | 2 | | $2\frac{11}{16}$ | 28 | 5 |
| 71 | 2 | | ,, | 28 | 7 |
| 61 | | $10\frac{7}{8}$ | $2\frac{5}{8}$ | 13 | $3\frac{1}{2}$ |
| 62 | 1 | $9\frac{1}{2}$ | ,, | 26 | $3\frac{1}{2}$ |
| 63 | 1 | 8 | ,, | 24 | 5 |
| 64 | 1 | 8 | ,, | 24 | 5 |

| No. | Diameter. | | Pitch. | No. Cogs. | Length of Cogs. | |
|---|---|---|---|---|---|---|
| | Ft. | In. | Inches. | | Inches. | |
| 65 | 13 | 10½ | 2⅝ | 201 | 7 | { 9 segmt. 13 cogs. 7 do. 12 do. |
| 67 | 10 | | ,, | 144 | 7 | 8 segmt. |
| 76 | 2 | 4 | ,, | 34 | 7 | |
| 437 | 1 | 10½ | ,, | 27 | 11 | |
| 436 | 14 | 2 | ,, | 208 | 11 | 16 segmt. |
| 446 | 18 | 5½ | ,, | 264 | 7 | 24 segmt. |
| 54 | 4 | 2 | ,, | 60 | 6 | |
| 32 | 13 | 4¾ | | 192 | 6¼ | 16 segmt. |
| 448 | 20 | | 2 9/16 | 300 | 7 | 20 segmt. |
| 28 | 13 | | ,, | 192 | 7 | 16 segmt. |
| 53 | 5 | 8¾ | ,, | 84 | 5 | |
| 562 | 1 | 10⅛ | ,, | 27 | 4 | |

| No. | Diameter. | | Pitch. | No. Cogs. | Length of Cogs. |
|---|---|---|---|---|---|
| | Ft. | In. | Inches. | | Inches. |
| 78 | 1 | $8\frac{1}{2}$ | $2\frac{9}{16}$ | 25 | 7 |
| 29 | 1 | $8\frac{5}{8}$ | ,, | 25 | 7 |
| 56 | 1 | $1\frac{1}{2}$ | ,, | 17 | $4\frac{3}{4}$ |
| 565 | | 10 | ,, | 12 | 6 |
| 57 | | $8\frac{3}{8}$ | ,, | 10 | 4 |
| 566 | | $11\frac{3}{4}$ | ,, | 14 | 5 |
| 567 | 2 | 1 | ,, | 30 | 4 |
| 568 | 2 | $1\frac{3}{4}$ | ,, | 31 | 4 |
| 569 | 1 | 11 | ,, | 28 | 5 |
| 570 | 1 | $9\frac{1}{2}$ | ,, | 26 | 4 |
| 571 | 1 | $8\frac{1}{2}$ | ,, | 25 | 4 |
| 633 | 2 | | ,, | 29 | 4 |
| 634 | 2 | $2\frac{5}{8}$ | ,, | 32 | $4\frac{3}{4}$ |
| 645 | 1 | $\frac{1}{4}$ | ,, | 15 | 4 |
| 663 | 12 | $10\frac{1}{2}$ | ,, | 178 | 5   { 14 segmt. 11 cogs. <br>     2 do.   12 do. |

| No. | Diameter | | Pitch. | No. Cogs. | Length of Cogs. | |
|---|---|---|---|---|---|---|
| | Ft. | In. | Inches. | | Inches. | |
| 35 | 2 | 10 | 2½ | 42 | 7 | |
| 36 | 1 | ¾ | ,, | 16 | 5¼ | |
| 37 | 16 | 2 | ,, | 242 | 4⅛ | 22 segmt. |
| 39 | 1 | 7⅝ | ,, | 24 | 3⅞ | |
| 30 | 18 | 1⅜ | ,, | 272 | 5½ | 16 segmt. |
| 31 | 2 | ¼ | ,, | 30 | 5½ | |
| 34 | 18 | 1 | ,, | 272 | 7 | 16 segmt. |
| 40 | 2 | 2½ | ,, | 33 | 5½ | } pinions for |
| 41 | 1 | 4 | ,, | 20 | 5½ | } mortise |
| 42 | 1 | 1¾ | ,, | 17 | 5 | } wheels. |
| 43 | 4 | 5 | ,, | 66 | 5 | mortise. |
| 44 | 17 | 2 | ,, | 256 | 7¼ | 16 segmt. |
| 45 | 2 | 10¾ | ,, | 43 | 7¼ | |
| 46 | 15 | 10½ | ,, | 240 | 7 | 16 segmt. |
| 47 | 2 | ¼ | ,, | 30 | 7 | |
| 48 | 11 | 6 | ,, | 176 | 5 | 16 segmt. |
| 49 | 1 | 7 | ,, | 24 | 5 | |
| 50 | 21 | | ,, | 312 | 8½ | 24 segmt. |
| 51 | 2 | ¾ | ,, | 31 | 8½ | |
| 52 | 4 | 6½ | ,, | 68 | 6 | |
| 395 | 3 | 2 | ,, | 48 | 6½ | |
| 396 | 1 | | ,, | 15 | 7 | |
| 397 | | 11 | ,, | 14 | 7½ | |

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| No. | Diameter. | | Pitch. | No. Cogs. | Length of Cogs. |
|---|---|---|---|---|---|
| | Ft. | In. | Inches. | | Inches. |
| 398 | 1 | 2¼ | 2½ | 18 | 8 |
| 399 | 10 | | ,, | 152 | 5½    8 segmt. |
| 400 | 7 | | ,, | 108 | 6 |
| 58 | 4 | 11 | ,, | 76 | 4¾ {4 segmt. 13 cogs. / 2 do. 12 do. |
| 66 | 21 | 7 | ,, | 320 | 7   16 segmt. |
| 68 | 18 | | ,, | 272 | 6   16 segmt. |
| 70 | 9 | 2 | ,, | 140 | 5 {8 segmt. 12 cogs. / 4 do. 11 do. |
| 69 | 18 | | ,, | 272 | 7   16 segmt. |
| 72 | 2 | | ,, | 30 | 7 |
| 77 | 1 | 8 | ,, | 25 | 7 |
| 79 | 3 | 10 | ,, | 58 | 6 |
| 488 | 2 | 4½ | ,, | 36 | 6 |
| 490 | 1 | 11¼ | ,, | 29 | 5½ {To run with mortise. |
| 572 | 1 | 5¾ | ,, | 22 | 5½ |
| 573 | 1 | 2¼ | ,, | 18 | 6½ |
| 489 | 1 | ¼ | ,, | 15 | 4 |
| 574 | | 8 5⁄16 | ,, | 10 | 5 |
| 575 | 3 | 6 | ,, | 53 | 5¾ |
| 631 | 1 | 8 | ,, | 25 | 7 {To run with mortise. |
| 637 | 1 | 7¼ | ,, | 25 | 7 |
| 654 | 3 | | ,, | 52 | 7 |
| 659 | 7 | | ,, | 107 | 7 {5 segmts. 13 cogs. / 8 do. 14 do. |
| 667 | 8 | | ,, | 120 | 4   8 segmt. |
| 23 | 16 | ½ | ,, | 240 | 7   16 segmt. |

| No. | Diameter. | | Pitch. | No. Cogs. | Length of Cogs. | |
|---|---|---|---|---|---|---|
| | Ft. | In. | Inches. | | Inches. | |
| 81 | 18 | $1\frac{1}{2}$ | $2\frac{7}{16}$ | 280 | 4 | 20 segmt. |
| 87 | 17 | | ,, | 264 | $5\frac{1}{2}$ | 24 segmt. |
| 447 | 14 | $6\frac{1}{2}$ | ,, | 224 | $5\frac{1}{2}$ | 16 segmt. |
| 424 | 1 | 8 | ,, | 26 | 6 | |
| 576 | 1 | $3\frac{11}{16}$ | ,, | 20 | $5\frac{1}{2}$ | |
| 463 | 12 | | ,, | 192 | $5\frac{1}{8}$ | 12 segmt. |
| 215 | 11 | 10 | ,, | 186 | 6 | { 10 segmt. 12 cogs. / 6 do. 11 do. |
| 33 | 11 | 6 | ,, | 176 | $5\frac{1}{2}$ | 8 segmt. |

| No. | Diameter | | Pitch. | No. Cogs. | Length of Cogs. |
|---|---|---|---|---|---|
| | Ft. | In. | Inches. | | Inches. |
| 90 | 15 | | 2⅜ | 240 | 6   16 segmt. |
| 91 | 2 | 11¼ | ,, | 47 | 6 |
| 92 | 1 | | ,, | 16 | 6 |
| 94 | 14 | | ,, | 224 | 5   16 segmt. |
| 95 | 11 | 6 | ,, | 192 | 4   12 segmt. |
| 96 | 2 | 1⅜ | ,, | 33 | 5⅞ |
| 97 | 9 | | ,, | 143 | 6   16 segmt. |
| 99 | 4 | 1½ | ,, | 66 | 6 |
| 100 | 1 | 4½ | ,, | 22 | 6 |
| 101 | 12 | 1½ | ,, | 192 | 5¼ |
| 102 | 1 | 6⅜ | ,, | 24 | 5½ |
| 103 | 2 | | ,, | 32 | 5½ |
| 104 | 15 | 10½ | ,, | 156 | 4   16 segmt. |
| 105 | 1 | 4½ | ,, | 22 | 4 |
| 106 | 8 | 1½ | ,, | 130 | 5½   10 segmt. |
| 420 | 1 | 7½ | ,, | 26 | 6 |
| 421 | 24 | 1½ | ,, | 384 | 7   24 segmt. |
| 422 | 1 | 4¾ | ,, | 22 | 7 |
| 418 | 5 | 7¼ | ,, | 86 | 5   { 6 segmt. 11 cogs. / 2 do. 10 do. |
| 419 | 23 | 10 | ,, | 382 | 5½   { 30 segmt. 12 cogs. / 2 do. 11 do. |
| 89 | 17 | | ,, | 272 | 6¼   16 segmt. |
| 88 | 9 | 9 | ,, | 156 | 5¼   12 segmt. |
| 86 | 20 | | ,, | 321 | 5½   { 9 segmt. 14 cogs. / 15 do. 13 do. |
| 85 | 13 | 2 | ,, | 216 | 6   { 16 segmt. 11 cogs. / 4 do. 10 do. |

| No. | Diameter. | | Pitch. | No. Cogs. | Length of Cogs. | |
|-----|-----------|----|--------|-----------|-----------------|---|
| | Ft. | In. | Inches. | | Inches. | |
| 84 | 5 | 4½ | 2⅜ | 86 | 6 | { 7 segmt. 11 cogs.<br>1 do. 9 do. |
| 83 | 2 | ¼ | ,, | 32 | 6½ | |
| 430 | 15 | | ,, | 262 | 5 | { 6 segmt. 17 cogs.<br>10 do. 16 do. |
| 429 | 9 | 7½ | ,, | 156 | 6 | 12 segmt. |
| 428 | 1 | 7½ | ,, | 26 | 6 | |
| 82 | 1 | 4¾ | ,, | 22 | 7 | |
| 449 | 24 | | ,, | 384 | 7 | 24 segmt. |
| 501 | 12 | 3 | ,, | 196 | 6½ | { 4 segmt. 17 cogs.<br>8 do. 16 do. |
| 656 | 1 | 5⅝ | ,, | 23 | 5½ | |
| 653 | 3 | 1¼ | ,, | 48 | 5½ | |
| 577 | 2 | 4⅛ | ,, | 37 | 6½ | |
| 648 | | 9½ | ,, | 12 | 5½ | |
| 650 | 2 | 3¾ | ,, | 37 | 6 | |
| 652 | 1 | 10½ | ,, | 30 | 6 | |
| 661 | 24 | | ,, | 386 | 6 | { 22 segmt. 16 cogs.<br>2 do. 17 do. |
| 662 | 22 | 1¾ | ,, | 352 | 6½ | 16 segmt. |
| 20 | 18 | 4 | ,, | 288 | 7 | 24 segmt. |

| No. | Diameter. | | Pitch. | No. Cogs. | Length of Cogs. | |
|-----|-----|-----|-----|-----|-----|-----|
| | Ft. | In. | Inches. | | Inches. | |
| 107 | 11 | 7 | $2\frac{5}{16}$ | 192 | $6\frac{1}{2}$ | 16 segmt. |
| 108 | 1 | $6\frac{1}{4}$ | ,, | 25 | $6\frac{1}{2}$ | |
| 110 | 16 | $1\frac{1}{2}$ | ,, | 264 | 5 | 24 segmt. |
| 111 | 1 | 6 | ,, | 24 | 5 | |
| 112 | 1 | | ,, | 16 | 5 | |
| 113 | | $8\frac{7}{8}$ | ,, | 12 | 5 | |
| 114 | 11 | $10\frac{5}{8}$ | ,, | 194 | 5 | { 10 segmt. 16 cogs. { 2 do. 17 do. |
| 578 | 16 | $3\frac{3}{4}$ | ,, | 266 | $4\frac{1}{4}$ | { 10 segmt 17 cogs. { 6 do. 16 do. |
| 19 | 1 | $10\frac{1}{4}$ | ,, | 30 | $5\frac{1}{4}$ | |
| 55 | 18 | 9 | ,, | 306 | $4\frac{1}{4}$ | 18 segmts. |
| 124 | 1 | $10\frac{3}{4}$ | $2\frac{1}{4}$ | 32 | $5\frac{1}{2}$ | |

| No. | Diameter | | Pitch. | No. Cogs. | Length of Cogs. |
|---|---|---|---|---|---|
| | Ft. | In. | Inches. | | Inches. |
| 125 | 15 | 10¾ | 2¼ | 270 | 5½ 18 segmt. |
| 126 | 2 | 4½ | ,, | 39 | 5 |
| 128 | 13 | 9 | ,, | 228 | 4½ 19 segmt. |
| 129 | 1 | 8½ | ,, | 28 | 5 |
| 130 | 8 | 6 | ,, | 144 | 4⅞ 12 segmt. |
| 133 | 1 | ⅝ | ,, | 17 | 12 } pinions for |
| 134 | | 11½ | ,, | 16 | 12 } rolling-mills. |
| 135 | 28 | | ,, | 432 | 7  24 segmt. |
| 136 | 17 | | ,, | 288 | 7  16 segmt. |
| 137 | 20 | | ,, | 336 | 7  24 segmt. |
| 138 | 7 | 10½ | ,, | 132 | 5½ 11 segmt. |
| 139 | 3 | 4¼ | ,, | 57 | 7 |
| 140 | 2 | 9 | ,, | 47 | 7 |
| 141 | 2 | 11¾ | ,, | 50 | 5½ |
| 143 | 2 | 5¼ | ,, | 41 | 7 |
| 144 | 1 | 9¼ | ,, | 31 | 7 |
| 145 | 2 | 1½ | ,, | 36 | 7 |
| 146 | | 9¼ | ,, | 13 | 7 |
| 147 | 1 | 3¾ | ,, | 22 | 5½ |
| 149 | 15 | | ,, | 256 | 5  16 segmt. |
| 123 | 12 | | ,, | 201 | 5½ {12 segmt. 14 cogs. 3 do. 11 do.} |
| 122 | 16 | | ,, | 256 | 5½ 16 segmt. |
| 121 | 10 | | ,, | 168 | 5½  8 segmt. |
| 120 | 2 | 4 | ,, | 38 | 5 |
| 438 | 1 | 7½ | ,, | 27 | 5 |

| No. | Diameter. | | Pitch. | No. Cogs. | Length of Cogs. | |
|---|---|---|---|---|---|---|
| | Ft. | In. | Inches. | | Inches. | |
| 450 | 19 | | $2\frac{1}{4}$ | 320 | 7 | 16 segmt. |
| 451 | 18 | 2 | ,, | 304 | $5\frac{1}{2}$ | 16 segmt. |
| 491 | 2 | $1\frac{7}{8}$ | ,, | 36 | 7 | |
| 492 | 32 | 1 | ,, | 539 | 7 | { 35 segmt. 15 cogs.<br>{ 1 do. 14 do. |
| 579 | 19 | $9\frac{3}{4}$ | ,, | 336 | $5\frac{1}{2}$ | 24 segmt. |
| 581 | 10 | | ,, | 168 | 7 | { 8 segmt. 10 cogs.<br>{ 8 do. 11 do. |
| 582 | 1 | $8\frac{1}{2}$ | ,, | 28 | 5 | |
| 624 | 2 | $1\frac{3}{4}$ | ,, | 36 | 7 | |
| 638 | 1 | 10 | ,, | 31 | 5 | |
| 649 | | $8\frac{1}{2}$ | ,, | 11 | $5\frac{1}{4}$ | |
| 217 | 7 | $1\frac{1}{2}$ | ,, | 120 | 5 | 12 segmt. |
| 24 | 17 | $4\frac{3}{8}$ | ,, | 288 | 8 | 16 segmt. |

| No. | Diameter | | Pitch. | No. Cogs. | Length of Cogs. |
|---|---|---|---|---|---|
| | Ft. | In. | Inches. | | Inches. |
| 481 | 9 | 4 | $2\frac{3}{16}$ | 160 | $5\frac{1}{2}$ { 4 segmt. 14 cogs. / 8 do. 13 do. |
| 493 | 3 | $8\frac{1}{4}$ | ,, | 65 | $4\frac{1}{4}$ mortise. |
| 142 | 1 | $3\frac{1}{4}$ | ,, | 39 | $4\frac{1}{2}$ mortise. |
| 668 | 6 | 9 | $2\frac{1}{8}$ | 120 | 4 8 segmt. |
| 666 | 17 | $10\frac{3}{4}$ | ,, | 322 | $4\frac{1}{2}$ {18 segmt. 16 cogs. / 2 do. 17 do. |
| 655 | 2 | $9\frac{3}{4}$ | ,, | 49 | 5 |
| 632 | | $10\frac{1}{8}$ | ,, | 15 | 6 |
| 583 | 12 | 4 | ,, | 216 | 5 { 8 segmt. 14 cogs. / 8 do. 13 do. |
| 584 | 1 | $9\frac{7}{8}$ | ,, | 32 | 4 |
| 585 | 1 | $7\frac{1}{4}$ | ,, | 28 | 4 |
| 586 | 1 | $4\frac{1}{4}$ | ,, | 18 | 4 |
| 587 | 3 | $8\frac{1}{2}$ | ,, | 65 | 4 mortise. |

| No. | Diameter | | Pitch. | No. Cogs. | Length of Cogs | |
|---|---|---|---|---|---|---|
| | Ft. | In. | Inches. | | Inches. | |
| 622 | 4 | 2¼ | 2⅛ | 73 | 4 | |
| 623 | | 7 | ,, | 10 | 5 | |
| 651 | 1 | 6 | ,, | 26 | 4 | |
| 109 | 2 | 9 | ,, | 48 | 5 | |
| 535 | 1 | 6⅜ | ,, | 27 | 4 | |
| 431 | 15 | 10½ | ,, | 283 | 4 | { 11 segmt. 18 cogs. 5 do. 17 do. |
| 494 | 3 | 1 | ,, | 54 | 4 | mortise. |
| 150 | 6 | 10⅝ | ,, | 120 | 4 | |
| 151 | 5 | 4½ | ,, | 94 | 4 | |
| 152 | 3 | 8½ | ,, | 65 | 4 | |
| 153 | 2 | 7½ | ,, | 46 | 4 | |
| 154 | 2 | ⅝ | ,, | 36 | 4 | |
| 155 | 2 | | ,, | 35 | 4 | |
| 156 | 1 | 1⅛ | ,, | 19 | 4 | |
| 157 | | 11 | ,, | 16 | 3⅝ | |
| 158 | | 9 | ,, | 13 | 5 | |
| 159 | 12 | 10½ | ,, | 224 | 3½ | 16 segmt. |
| 160 | 20 | | ,, | 352 | 4 | 32 segmt. |
| 161 | 13 | 8 | ,, | 240 | 4 | 16 segmt. |
| 162 | 11 | 10 | ,, | 213 | 4 | 16 segmt. |
| 163 | 10 | | ,, | 180 | 4 | 12 segmt. |
| 164 | 14 | | ,, | 252 | 4 | { 12 segmt. 16 cogs. 4 do. 15 do. |
| 166 | 11 | 2 | ,, | 192 | 5¼ | 16 segmt. |
| 167 | 10 | | ,, | 180 | 5 | 12 segmt. |
| 168 | 11 | | ,, | 198 | 5 | 18 segmt. |

| No. | Diameter. | | Pitch. | No. Cogs. | Length of Cogs. |
|-----|-----|-----|--------|-----------|-----------------|
| | Ft. | In. | Inches. | | Inches. |
| 169 | 2 | 1 | $2\frac{1}{8}$ | 37 | 5 |
| 170 | 1 | $5\frac{3}{4}$ | ,, | 26 | 5 |
| 171 | 7 | $10\frac{1}{4}$ | ,, | 140 | 4    10 segmt. |
| 172 | | 11 | ,, | 16 | $4\frac{1}{4}$ |
| 173 | 4 | 8 | ,, | 83 | 4  { 3 segmt. 11 cogs. / 5 do. 10 do. |
| 174 | 6 | | ,, | 105 | 4    7 segmt. |
| 182 | 10 | $10\frac{3}{4}$ | ,, | 195 | 5  { 3 segmt. 13 cogs. / 13 do. 12 do. |
| 183 | 8 | $1\frac{1}{2}$ | ,, | 144 | 5    8 segmt. |
| 184 | 5 | 4 | ,, | 94 | 4  { 6 segmt. 12 cogs. / 2 do. 11 do. |
| 185 | 15 | | ,, | 265 | 4  { 15 segmt. 17 cogs. / 1 do. 16 do. |
| 186 | 5 | $11\frac{1}{2}$ | ,, | 106 | 4  { 2 segmt. 14 cogs. / 6 do. 13 do. |
| 187 | 2 | 5 | ,, | 43 | 5 |
| 115 | 2 | $3\frac{1}{2}$ | ,, | 41 | 5 |

| No. | Diameter. | | Pitch. | No. Cogs. | Length of Cogs. | |
|-----|-----|-----|-----|-----|-----|-----|
| | Ft. | In. | Inches. | | Inches. | |
| 175 | 11 | 10½ | 2 | 228 | 4⅛ | 12 segmt. |
| 176 | 10 | 1 | ,, | 192 | 4 | 12 segmt. |
| 177 | 7 | | ,, | 132 | 4 | 12 segmt. |
| 178 | 1 | 6⅜ | ,, | 29 | 4⅛ | |
| 180 | | 11 | ,, | 17 | 7 | |
| 181 | 14 | 1½ | ,, | 256 | 5 | 16 segmt. |
| 116 | 3 | 1¼ | ,, | 59 | 5½ | |
| 444 | 2 | 2½ | ,, | 42 | 5½ | |
| 443 | 5 | | ,, | 96 | 4½ | mortise. |
| 445 | 11 | | ,, | 208 | 6 | 16 segmt. |
| 495 | 2 | ¼ | ,, | 38 | 5 | mortise. |
| 590 | 2 | 1 | ,, | 39 | 6 | |
| 591 | 1 | 4⅞ | ,, | 26 | 5⅜ | { To run with mortise. |
| 625 | 1 | 5⅛ | ,, | 27 | 6 | { To run with mortise. |
| 628 | 1 | ¾ | ,, | 20 | 4 | |

| No. | Diameter. | | Pitch. | No. Cogs. | Length of Cogs. | |
|-----|-----------|----|--------|-----------|-----------------|----|
| | Ft. | In. | Inches. | | Inches. | |
| 188 | 7 | 2 | $1\frac{7}{8}$ | 144 | $2\frac{3}{4}$ | 8 segmt. |
| 189 | | $9\frac{5}{8}$ | ,, | 16 | 3 | |
| 561 | | 5 | $1\frac{3}{4}$ | 9 | 5 | |
| 563 | 1 | $4\frac{1}{4}$ | ,, | 29 | 7 | |
| 564 | | $7\frac{3}{4}$ | ,, | 14 | 7 | |
| 195 | 14 | | ,, | 304 | 4 | 16 segmt. |
| 196 | 11 | 6 | ,, | 252 | $3\frac{3}{4}$ | 18 segmt. |
| 197 | 11 | 4 | ,, | 252 | 5 | 12 segmt. |

| No. | Diameter. | | Pitch. | No. Cogs. | Length of Cogs. |
|---|---|---|---|---|---|
| | Ft. | In. | Inches. | | Inches. |
| 198 | 9 | 10 | 1¾ | 216 | 4　18 segmt. |
| 199 | 5 | | ,, | 108 | 4　6 segmt. |
| 200 | 4 | 11⅝ | ,, | 108 | 4¾ |
| 201 | 3 | 4¼ | ,, | 73 | 4¾ |
| 202 | 1 | 6⅞ | ,, | 34 | 4 |
| 203 | 1 | 5⅝ | ,, | 32 | 5¼ |
| 204 | 1 | 1⅞ | ,, | 25 | 4⅛ |
| 205 | | 10 | ,, | 18 | 4¾ |
| 206 | 1 | 7⅞ | ,, | 36 | 3⅛ |
| 207 | 7 | 6 | ,, | 160 | 3⅝　10 segmt. |
| 208 | 8 | 6 | ,, | 187 | 3½　11 segmt. |
| 209 | 8 | | ,, | 176 | 4　16 segmt. |
| 210 | 1 | 1½ | ,, | 24 | 3⅝ |
| 211 | 1 | 1½ | ,, | 25 | 4 |
| 212 | 10 | 10 | ,, | 234 | 5　18 segmt. |
| 213 | 6 | 1 | ,, | 132 | 7 |
| 214 | 1 | 2 | ,, | 25 | 7 |
| 194 | 1 | ¼ | ,, | 22 | 7 |
| 192 | | 7½ | ,, | 14 | 7 |
| 191 | 1 | 5 | ,, | 31 | 4½ |
| 190 | | 9½ | ,, | 17 | 4 |
| 119 | | 7¾ | ,, | 14 | 4 |
| 118 | | 6 | ,, | 11 | 4 |
| 434 | 4 | | ,, | 86 | 4 |
| 433 | 1 | ¼ | ,, | 22 | 4 |
| 432 | 3 | ¼ | ,, | 65 | 4 |

| No. | Diameter. | | Pitch. | No. Cogs. | Length of Cogs. |
|---|---|---|---|---|---|
| | Ft. | In. | Inches. | | Inches. |
| 427 | 2 | ¼ | 1¾ | 43 | 4 |
| 426 | 2 | 5¼ | ,, | 53 | 4¾ |
| 441 | 9 | 5 | ,, | 204 | 3½  12 segmt. |
| 496 | 1 | 8½ | ,, | 37 | 4 |
| 504 | | 11⅞ | ,, | 21 | 4 |
| 592 | 4 | | ,, | 86 | 4  mortise. |
| 593 | 3 | 1 | ,, | 66 | 4½  mortise. |
| 594 | 12 | 1½ | ,, | 264 | 4 { 8 segmt. 16 cogs. / 8 do. 17 do. |
| 595 | 3 | 6½ | ,, | 76 | 4¾ |
| 596 | 1 | 8 | ,, | 36 | 4⅛ |
| 597 | 3 | 1⅞ | ,, | 68 | 7 |
| 598 | | 8⅞ | ,, | 16 | 4⅝ |
| 599 | | 10¾ | ,, | 19 | 4 |
| 600 | 1 | 8⅜ | ,, | 36 | 5¼ { To run with mortise. |
| 646 | | 10 | ,, | 18 | 5 |
| 647 | | 5⅝ | ,, | 10 | 4 |
| 664 | 10 | 2 | ,, | 222 | 5 { 6 segmt. 19 cogs. / 6 do. 18 do. |
| 38 | 7 | 5½ | ,, | 160 | 4¾  10 segmt. |

| No. | Diameter. | | Pitch. | No. Cogs. | Length of Cogs. |
|---|---|---|---|---|---|
| | Ft. | In. | Inches. | | Inches. |
| 225 | 7 | 6 | $1\frac{5}{8}$ | 174 | 5 |
| 226 | 1 | | ,, | 23 | 5 |
| 227 | 1 | 1 | ,, | 25 | 5 |
| 553 | 1 | $9\frac{5}{8}$ | ,, | 42 | 6 |

| No. | Diameter | | Pitch. | No. Cogs. | Length of Cogs | |
|---|---|---|---|---|---|---|
| | Ft. | In. | Inches. | | Inches. | |
| 440 | 2 | | $1\frac{9}{16}$ | 48 | 3 | |
| 439 | 6 | 11 | ,, | 128 | 3 | 12 segmt. |
| 232 | 12 | $1\frac{1}{2}$ | $1\frac{1}{2}$ | 288 | 3 | 18 segmt. |
| 233 | 11 | | ,, | 272 | $3\frac{1}{2}$ | 16 segmt. |
| 234 | 5 | 10 | ,, | 144 | 3 | 12 segmt. |
| 235 | 10 | $2\frac{1}{2}$ | ,, | 256 | 3 | 16 segmt. |
| 236 | 3 | 7 | ,, | 89 | ·3 | |
| 237 | 2 | 6 | ,, | 62 | 3 | |
| 238 | 2 | $2\frac{1}{8}$ | ,, | 54 | 3 | |
| 239 | 1 | 6 | ,, | 37 | 3 | |
| 240 | | $8\frac{1}{2}$ | ,, | 18 | $3\frac{1}{8}$ | |
| 241 | | $8\frac{1}{4}$ | ,, | 17 | $3\frac{1}{4}$ | |
| 242 | | $7\frac{3}{8}$ | ,, | 15 | $3\frac{1}{4}$ | |
| 243 | 7 | | ,, | 180 | $2\frac{3}{4}$ | 12 segmt. |

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| No. | Diameter | | Pitch. | No. Cogs. | Length of Cogs. | |
|---|---|---|---|---|---|---|
| | Ft. | In. | Inches. | | Inches. | |
| 244 | | $6\frac{1}{8}$ | $1\frac{1}{2}$ | 13 | $3\frac{1}{4}$ | |
| 245 | | $5\frac{5}{8}$ | ,, | 12 | $3\frac{1}{2}$ | |
| 246 | 1 | 3 | ,, | 31 | 3 | |
| 247 | 6 | | ,, | 152 | $4\frac{1}{2}$ | |
| 248 | 5 | | ,, | 128 | $4\frac{1}{2}$ | |
| 249 | 8 | $4\frac{1}{2}$ | ,, | 216 | 4 | 12 segmt. |
| 250 | 10 | | ,, | 252 | $3\frac{1}{4}$ | 12 segmt. |
| 251 | 7 | 4 | ,, | 192 | $3\frac{3}{8}$ | 12 segmt. |
| 252 | 5 | 10 | ,, | 140 | $3\frac{1}{4}$ | {7 segmt. 18 cogs. / 1 do. 14 do.} |
| 253 | 3 | | ,, | 75 | $4\frac{1}{2}$ | |
| 254 | 1 | 8 | ,, | 42 | $4\frac{1}{2}$ | |
| 255 | 1 | 6 | ,, | 38 | $4\frac{1}{2}$ | |
| 401 | | 9 | ,, | 20 | $4\frac{1}{2}$ | |
| 402 | 1 | | ,, | 25 | $4\frac{1}{2}$ | |
| 403 | | $7\frac{1}{8}$ | ,, | 15 | $4\frac{1}{2}$ | |
| 404 | 2 | | ,, | 50 | $3\frac{1}{4}$ | |
| 405 | 4 | $4\frac{1}{2}$ | ,, | 110 | $3\frac{1}{4}$ | |
| 406 | 3 | | ,, | 75 | $3\frac{1}{4}$ | |
| 407 | 1 | $2\frac{3}{8}$ | ,, | 30 | $3\frac{1}{4}$ | |
| 408 | 1 | | ,, | 25 | $3\frac{1}{4}$ | |
| 409 | | $8\frac{5}{8}$ | ,, | 18 | $3\frac{1}{4}$ | |
| 410 | | $5\frac{7}{8}$ | ,, | 12 | $3\frac{1}{4}$ | |
| 257 | 25 | 9 | ,, | 646 | $3\frac{1}{4}$ | 38 segmt. |
| 258 | 16 | $\frac{1}{2}$ | ,, | 408 | 3 | 24 segmt. |
| 259 | 1 | 11 | ,, | 48 | $3\frac{1}{4}$ | |
| 284 | 4 | $6\frac{3}{4}$ | ,, | 115 | $3\frac{1}{4}$ | |

| No. | Diameter. | | Pitch. | No. Cogs. | Length of Cogs. | |
|---|---|---|---|---|---|---|
| | Ft. | In. | Inches. | | Inches. | |
| 117 | 5 | 2¾ | 1½ | 130 | 3 | |
| 425 | 10 | 1 | ,, | 240 | 3 | 16 segmt. |
| 497 | | 10⅛ | ,, | 21 | 3¼ | |
| 601 | 2 | 10¼ | ,, | 72 | 3¼ | |
| 505 | 1 | 8 | ,, | 41 | 3¼ | |
| 604 | | 5½ | ,, | 11 | 3¼ | |
| 626 | | 9½ | ,, | 20 | 3½ | |
| 131 | 8 | ½ | ,, | 204 | 2⅝ | 12 segmt. |
| 629 | 1 | 1⅛ | ,, | 26 | 3 | |
| 639 | | 4½ | ,, | 9 | 3¾ | |
| 665 | 23 | 5 | ,, | 600 | 3¼ | 30 segmt. |

| No. | Diameter | | Pitch. | No. Cogs. | Length of Cogs. |
|---|---|---|---|---|---|
| | Ft. | In. | Inches. | | Inches. |
| 256 | 4 | $1\frac{1}{4}$ | $1\frac{3}{8}$ | 96 | $3\frac{1}{4}$ mortise. |
| 286 | 2 | $4\frac{5}{8}$ | $1\frac{1}{4}$ | 71 | $2\frac{3}{4}$ |
| 287 | 1 | 7 | ,, | 48 | $2\frac{3}{4}$ |
| 288 | 1 | $2\frac{3}{8}$ | ,, | 36 | $2\frac{3}{4}$ |
| 289 | 1 | $1\frac{1}{2}$ | ,, | 34 | $2\frac{3}{4}$ |
| 290 | 1 | $\frac{5}{8}$ | ,, | 32 | $2\frac{3}{4}$ |
| 291 | 1 | | ,, | 30 | $2\frac{3}{4}$ |
| 292 | | $10\frac{3}{4}$ | ,, | 28 | $2\frac{3}{4}$ |
| 293 | | $10\frac{3}{8}$ | ,, | 26 | $2\frac{3}{4}$ |
| 294 | | $9\frac{3}{8}$ | ,, | 24 | $2\frac{3}{4}$ |
| 295 | | $8\frac{3}{4}$ | ,, | 22 | $2\frac{3}{4}$ |
| 296 | | $7\frac{1}{8}$ | ,, | 18 | $2\frac{3}{4}$ |
| 297 | | $6\frac{1}{4}$ | ,, | 16 | $2\frac{5}{8}$ |

| No. | Diameter. | | Pitch. | No. Cogs. | Length of Cogs. |
|---|---|---|---|---|---|
| | Ft. | In. | Inches. | | Inches. |
| 298 | | $4\frac{3}{4}$ | $1\frac{1}{4}$ | 12 | $2\frac{3}{4}$ |
| 299 | | $4\frac{1}{2}$ | ,, | 11 | $2\frac{7}{8}$ |
| 300 | 1 | $2\frac{1}{2}$ | ,, | 38 | $1\frac{5}{8}$ |
| 301 | | $7\frac{1}{2}$ | ,, | 19 | $1\frac{5}{8}$ |
| 302 | 2 | 6 | ,, | 75 | $3\frac{3}{4}$ |
| 285 | 1 | $5\frac{1}{2}$ | ,, | 44 | $3\frac{3}{4}$ |
| 605 | 1 | $1\frac{1}{8}$ | ,, | 33 | $3\frac{1}{2}$ |
| 606 | | $9\frac{1}{2}$ | ,, | 24 | $3\frac{1}{2}$ |
| 607 | 3 | $3\frac{7}{8}$ | ,, | 100 | $3\frac{7}{8}$ |
| 608 | | $11\frac{3}{4}$ | ,, | 30 | $3\frac{1}{2}$ |
| 609 | | 6 | ,, | 15 | $3\frac{3}{4}$ |
| 658 | 1 | $8\frac{1}{8}$ | ,, | 28 | 8 |

| No. | Diameter | | Pitch. | No. Cogs. | Length of Cogs. |
|---|---|---|---|---|---|
| | Ft. | In. | Inches. | | Inches. |
| 263 | 3 | | $1\frac{3}{16}$ | 96 | 3 |
| 282 | 2 | $\frac{1}{2}$ | ,, | 65 | $2\frac{1}{4}$ |
| 499 | 1 | $3\frac{5}{8}$ | ,, | 42 | 3 |
| 610 | | $4\frac{5}{8}$ | ,, | 12 | $2\frac{1}{2}$ |
| 611 | | 6 | ,, | 16 | $2\frac{1}{4}$ |
| 283 | | $4\frac{1}{8}$ | ,, | 11 | $2\frac{1}{2}$ |
| 630 | | $5\frac{1}{4}$ | ,, | 14 | 3 |
| 612 | 2 | $\frac{1}{2}$ | ,, | 65 | 3   mortise. |
| 613 | | $7\frac{5}{8}$ | ,, | 20 | 3 |
| 614 | 1 | 6 | ,, | 48 | 2 |
| 498 | 1 | 10 | ,, | 58 | 3 |
| 262 | 3 | $7\frac{3}{4}$ | ,, | 116 | 3 |
| 264 | 2 | $1\frac{1}{2}$ | ,, | 65 | 3 |
| 265 | 1 | 8 | ,, | 53 | 3 |
| 266 | 1 | 6 | ,, | 48 | 3 |
| 267 | 1 | 2 | ,, | 37 | 3 |
| 268 | | $10\frac{1}{4}$ | ,, | 27 | 3 |
| 269 | | 9 | ,, | 24 | 3 |
| 270 | | $6\frac{1}{8}$ | ,, | 16 | 3 |
| 271 | | $4\frac{1}{8}$ | ,, | 10 | $2\frac{3}{4}$ |
| 272 | 19 | 6 | ,, | 630 | 3   30 segmt. |
| 273 | 1 | 4 | ,, | 43 | 3 |
| 274 | 1 | | ,, | 32 | $2\frac{1}{4}$ |
| 275 | | $7\frac{7}{8}$ | ,, | 21 | $2\frac{1}{4}$ |
| 276 | | $4\frac{1}{4}$ | ,, | 11 | 3 |
| 277 | 2 | $3\frac{3}{4}$ | ,, | 78 | $2\frac{5}{8}$ |

| No. | Diameter. | | Pitch. | No. Cogs. | Length of Cogs. |
|---|---|---|---|---|---|
| | Ft. | In. | Inches. | | Inches. |
| 278 | | $5\frac{5}{8}$ | $1\frac{3}{16}$ | 16 | 3 |
| 279 | | $9\frac{1}{4}$ | ,, | 27 | $2\frac{3}{4}$ |
| 280 | | 8 | ,, | 21 | 3 |
| 281 | | 7 | ,, | 18 | 3 |
| 228 | 3 | 4 | ,, | 106 | 3 |
| 229 | 2 | 6 | ,, | 80 | 3 |
| 230 | | $11\frac{3}{4}$ | ,, | 31 | 3 |
| 231 | | 8 | ,, | 22 | $2\frac{1}{2}$ |
| 260 | 1 | $2\frac{1}{2}$ | ,, | 39 | $2\frac{1}{4}$ |
| 261 | 1 | $9\frac{1}{2}$ | ,, | 60 | $2\frac{1}{2}$ |
| 219 | 27 | | ,, | 864 | 3    36 segmt. |

| No. | Diameter. | | Pitch. | No. Cogs. | Length of Cogs. |
|---|---|---|---|---|---|
| | Ft. | In. | Inches. | | Inches. |
| | | | . | | |
| 304 | 1 | 6 | $1\frac{1}{16}$ | 54 | 2 |
| 305 | 1 | | ,, | 36 | 2 |
| 306 | 2 | | ,, | 72 | 2 |
| 307 | 1 | 2 | ,, | 41 | 2 |
| 308 | | 6 | ,, | 18 | 2 |
| 615 | 2 | $1\frac{3}{4}$ | ,, | 75 | 2 |
| 616 | 1 | 10 | ,, | 66 | 2 |
| 336 | 1 | 8 | ,, | 58 | 2 |
| 309 | | 8 | ,, | 24 | 2 |
| 641 | | 5 | ,, | 15 | 2 |
| 642 | | 7 | ,, | 20 | $2\frac{1}{8}$ |

| No. | Diameter | | Pitch. | No. Cogs. | Length of Cogs. |
|---|---|---|---|---|---|
| | Ft. | In. | Inches. | | Inches. |
| 310 | 4 | 6 | 1 | 168 | 4½ . 6 segmt. |
| 311 | 4 | 5 | ,, | 162 | 3½ 6 segmt. |
| 312 | 4 | | ,, | 150 | 2¼ 6 segmt. |
| 313 | | 8 | ,, | 25 | 4½ |
| 314 | | 8¼ | ,, | 25 | 3½ |
| 315 | | 4 | ,, | 12 | 3¾ |
| 317 | | 9¾ | ,, | 31 | 3 |
| 318 | | 9⅜ | ,, | 30 | 3 |
| 319 | | 6⅞ | ,, | 22 | 3 |
| 320 | | 4¾ | ,, | 15 | 3 |
| 321 | | 3⅝ | ,, | 11 | 3 |
| 322 | 1 | 4 | ,, | 50 | 2¼ |
| 323 | | 8 | ,, | 25 | 2¼ |
| 324 | | 6¼ | ,, | 19 | 2¼ |
| 325 | | 4¼ | ,, | 13 | 2¼ |
| 326 | 1 | 4⅛ | ,, | 52 | 1¼ |
| 327 | | 7 | ,, | 23 | 1¼ |
| 328 | 2 | 7⅝ | ,, | 101 | 2¼ |
| 329 | 2. | 3¾ | ,, | 79 | 2¼ |
| 330 | | 7¾ | ,, | 25 | 2¼ |
| 331 | | 6⅛ | ,, | 20 | 2⅜ |

| No. | Diameter. | | Pitch. | No. Cogs. | Length of Cogs. |
|---|---|---|---|---|---|
| | Ft. | In. | Inches. | | Inches. |
| 332 | | 5 | 1 | 16 | $2\frac{1}{4}$ |
| 411 | | $4\frac{1}{8}$ | ,, | 13 | $2\frac{1}{4}$ |
| 412 | | $3\frac{3}{16}$ | ,, | 10 | $2\frac{1}{4}$ |
| 335 | 2 | $9\frac{3}{4}$ | ,, | 103 | 2 |
| 617 | 3 | 3 | ,, | 122 | 2 |
| 618 | 2 | 6 | ,, | 94 | $2\frac{1}{4}$ |
| 640 | | $11\frac{3}{4}$ | ,, | 37 | $2\frac{1}{4}$ |
| 644 | 1 | $\frac{1}{2}$ | ,, | 39 | $2\frac{1}{4}$ |
| 390 | 2 | | $\frac{7}{8}$ | 87 | 2 |
| 382 | | 10 | ,, | 35 | 2 |
| 381 | | $4\frac{1}{2}$ | ,, | 16 | 2 |
| 353 | | 4 | ,, | 15 | 2 |

| No. | Diameter. | | Pitch. | No. Cogs. | Length of Cogs. |
|---|---|---|---|---|---|
| | Ft. | In. | Inches. | | Inches. |
| 333 | 1 | $2\frac{3}{8}$ | $1\frac{3}{16}$ | 56 | $1\frac{3}{16}$ |
| 334 | | $4\frac{3}{8}$ | ,, | 17 | $1\frac{3}{16}$ |
| 340 | 2 | $\frac{1}{4}$ | $\frac{3}{4}$ | 100 | 3 |
| 341 | 1 | $1\frac{1}{8}$ | ,, | 50 | 3 |
| 342 | | $7\frac{1}{8}$ | ,, | 33 | 3 |
| 343 | | $6\frac{5}{8}$ | ,, | 27 | 3 |
| 344 | | $3\frac{7}{8}$ | ,, | 16 | 3 |
| 345 | 3 | $5\frac{5}{8}$ | ,, | 169 | 2 |
| 346 | | $10\frac{1}{2}$ | ,, | 41 | 2 |
| 347 | | $7\frac{3}{8}$ | ,, | 29 | 2 |
| 348 | | $6\frac{3}{8}$ | ,, | 26 | 2 |
| 349 | | $3\frac{1}{2}$ | ,, | 14 | 2 |

| No. | Diameter. | | Pitch. | No. Cogs. | Length of Cogs. |
|---|---|---|---|---|---|
| | Ft. | In. | Inches. | | Inches. |
| 350 | 2 | $5\frac{3}{8}$ | $\frac{3}{4}$ | 120 | $1\frac{1}{2}$ |
| 351 | 1 | $9\frac{1}{4}$ | ,, | 87 | $1\frac{1}{2}$ |
| 352 | 1 | $2\frac{5}{8}$ | ,, | 60 | $1\frac{1}{2}$ |
| 354 | 1 | $\frac{3}{8}$ | ,, | 50 | $1\frac{1}{2}$ |
| 355 | | $10\frac{1}{2}$ | ,, | 43 | $1\frac{1}{2}$ |
| 356 | | $9\frac{3}{4}$ | ,, | 40 | $1\frac{1}{2}$ |
| 357 | | $8\frac{3}{4}$ | ,, | 36 | $1\frac{1}{2}$ |
| 358 | | $7\frac{7}{8}$ | ,, | 32 | $1\frac{1}{2}$ |
| 359 | | $5\frac{7}{8}$ | ,, | 25 | $1\frac{1}{2}$ |
| 360 | | $5\frac{3}{8}$ | ,, | 22 | $1\frac{1}{2}$ |
| 361 | | $4\frac{5}{8}$ | ,, | 19 | $1\frac{1}{2}$ |
| 362 | | $3\frac{5}{8}$ | ,, | 15 | $1\frac{1}{2}$ |
| 363 | | 3 | ,, | 12 | $1\frac{1}{2}$ |
| 364 | | $2\frac{1}{4}$ | ,, | 9 | $1\frac{1}{2}$ |
| 365 | 2 | $1\frac{1}{2}$ | ,, | 98 | $1\frac{1}{2}$ |
| 366 | | $11\frac{7}{8}$ | ,, | 48 | $\frac{7}{8}$ |
| 367 | | $3\frac{1}{2}$ | ,, | 14 | $\frac{7}{8}$ |
| 368 | | 11 | ,, | 48 | $1\frac{1}{2}$ |
| 369 | | $2\frac{7}{8}$ | ,, | 12 | $1\frac{3}{4}$ |
| 370 | | $8\frac{3}{4}$ | ,, | 36 | $1\frac{1}{4}$ |
| 371 | | 5 | ,, | 20 | $1\frac{3}{8}$ |
| 372 | | $3\frac{1}{2}$ | ,, | 14 | $1\frac{3}{8}$ |
| 413 | | $2\frac{7}{8}$ | ,, | 12 | $1\frac{1}{2}$ |
| 339 | 1 | 6 | ,, | 74 | $1\frac{1}{2}$ |
| 502 | 2 | 2 | ,, | 109 | 3 |
| 503 | | $4\frac{5}{8}$ | ,, | 19 | 3 |

| No. | Diameter. | | Pitch. | No. Cogs. | Length of Cogs. |
|---|---|---|---|---|---|
| | Ft. | In. | Inches. | | Inches. |
| 619 | 1 | 3 | $\frac{3}{4}$ | 62 | 2 |
| 620 | | $7\frac{1}{2}$ | ,, | 31 | 2 |
| 373 | 1 | $2\frac{1}{2}$ | $\frac{11}{16}$ | 64 | 1 |
| 374 | | 3 | ,, | 13 | 1 |
| 375 | 1 | $5\frac{1}{2}$ | $\frac{5}{8}$ | 88 | 2 |

| No. | Diameter. | | Pitch. | No. Cogs. | Length of Cogs. |
|---|---|---|---|---|---|
| | Ft. | In. | Inches. | | Inches. |
| 376 | 1 | 3 | $\frac{5}{8}$ | 75 | 2 |
| 377 | | 5 | ,, | 25 | 2 |
| 643 | | $9\frac{3}{8}$ | ,, | 47 | 2 |
| 383 | 1 | $2\frac{5}{8}$ | $\frac{9}{16}$ | 80 | $1\frac{1}{4}$ |
| 384 | | $2\frac{1}{16}$ | ,, | 11 | $1\frac{1}{4}$ |
| 385 | 1 | $4\frac{3}{4}$ | ,, | 96 | $1\frac{1}{4}$ |
| 386 | | $4\frac{1}{8}$ | ,, | 24 | $1\frac{1}{2}$ |
| 414 | | 4 | ,, | 24 | $1\frac{1}{2}$ |
| 415 | | $3\frac{1}{8}$ | ,, | 23 | $1\frac{1}{8}$ |
| 416 | | $2\frac{1}{4}$ | ,, | 13 | $1\frac{3}{8}$ |
| 417 | | $2\frac{1}{8}$ | ,, | 12 | $1\frac{1}{2}$ |
| 387 | | $9\frac{7}{8}$ | $\frac{1}{2}$ | 64 | $1\frac{3}{8}$ |

| No. | Diameter. | | Pitch. | No. Cogs. | Length of Cogs. |
|---|---|---|---|---|---|
| | Ft. | In. | Inches. | | Inches. |
| 388 | | $6\frac{3}{4}$ | $\frac{1}{2}$ | 44 | $1\frac{3}{8}$ |
| 389 | | 3 | ,, | 19 | $1\frac{5}{16}$ |
| 392 | | 6 | $\frac{3}{8}$ | 48 | 1 |
| 393 | | $4\frac{1}{4}$ | ,, | 34 | $1\frac{1}{4}$ |
| 394 | 1 | $3\frac{1}{2}$ | ,, | 126 | $1\frac{1}{8}$ |
| 14 | | $9\frac{3}{4}$ | $\frac{5}{16}$ | 90 | $\frac{11}{16}$ |

| No. | Diameter. | | Pitch. | No. Cogs. | Length of Cogs. |
|-----|-----------|---|--------|-----------|-----------------|
| | Ft. | In. | Inches. | | Inches. |
| | 2 | | $1\frac{3}{16}$ | 65 | 3      right. |
| | 2 | | ,, | 65 | 3      left. |
| | worms. | | $4\frac{1}{2}$ | diam. | |

| No. | Diameter. | | Pitch. | No. Cogs. | Length of Cogs. |
|-----|-----------|----|--------|-----------|-----------------|
| | Ft. | In. | Inches. | | Inches. |

D

| No. | Diameter. | | Pitch. | No. Cogs. | Length of Cogs. | |
|---|---|---|---|---|---|---|
| | **Ft.** | **In.** | Inches. | | Inches. | |
| 207 | 5 | | 4 | 48 | 9 ⎱ | |
| 208 | 1 | 9 | ,, | 16 | 9 ⎰ | |
| 260 | 3 | 8 | 3¾ | 39 | 7¼ ⎱ | |
| 261 | 2 | 7 | ,, | 26 | 7¼ ⎰ | |
| 1 | 1 | 5¼ | 3 | 18 | 4½ | ⎱ To run with wooden ⎰ wheel of 54 cogs. |
| 174 | 2 | | ,, | 25 | 6⅜ | |
| 173 | 9 | 7 | ,, | 120 | 6⅜ | 12 segmt. |
| 189 | 7 | 8 | ,, | 96 | 5⅝ ⎱ | mortise. |
| 190 | 2 | | ,, | 25 | 5⅝ | |
| 209 | 4 | 2¼ | ,, | 52 | 8 | |
| 210 | 3 | 6½ | ,, | 44 | 8 | |

| No. | Diameter. | | Pitch. | No. Cogs. | Length of Cogs. |
|---|---|---|---|---|---|
| | Ft. | In. | Inches. | | Inches. |
| 211 | 9 | $7\frac{7}{8}$ | 3 | 120 | $5\frac{1}{2}$ ⎫ |
| 212 | 2 | | ,, | 25 | $5\frac{1}{2}$ ⎪ |
| 213 | 4 | 4 | ,, | 54 | 6 ⎬ mortise. |
| 214 | 2 | $9\frac{1}{2}$ | ,, | 35 | 6 ⎭ |
| 203 | 5 | $1\frac{1}{4}$ | $2\frac{7}{8}$ | 66 | 6 ⎫ |
| 204 | 2 | $1\frac{1}{4}$ | ,, | 26 | 6 ⎬ |
| 215 | 3 | $\frac{3}{4}$ | $2\frac{13}{16}$ | 41 | 6 ⎫ |
| 216 | 1 | $6\frac{7}{8}$ | ,, | 21 | 6 ⎬ |

| No. | Diameter. | | Pitch. | No. Cogs. | Length of Cogs. |
|---|---|---|---|---|---|
| | Ft. | In. | Inches. | | Inches. |
| 23 | 2 | 8 | $2\frac{3}{4}$ | 36 | 6 ⎫ |
| 24 | 3 | | ,, | 41 | 6 ⎬ |
| 2 | 3 | | ,, | 41 | 6 ⎭  mortise. |
| 183 | 2 | 10 | $2\frac{11}{16}$ | 40 | 6 ⎫ |
| 182 | 6 | $8\frac{1}{2}$ | ,, | 96 | 6 ⎬ 12 segmt. |
| 176 | 3 | 1 | $2\frac{5}{8}$ | 44 | 8 ⎫ |
| 175 | 5 | $\frac{5}{8}$ | ,, | 73 | 8 ⎬ |

| No. | Diameter. | | Pitch. | No. Cogs. | Length of Cogs. | |
|---|---|---|---|---|---|---|
| | Ft. | In. | Inches. | | Inches. | |
| 145 | 12 | | $2\frac{5}{8}$ | 176 | $7\frac{5}{8}$ | } 16 segmt. |
| 146 | 3 | $\frac{3}{8}$ | ,, | 45 | $7\frac{5}{8}$ | } |
| 147 | 8 | 10 | ,, | 128 | 7 | } 16 segmt. |
| 148 | 2 | 11 | ,, | 42 | 7 | } |
| 201 | 3 | $8\frac{1}{2}$ | ,, | 53 | 7 | } |
| 202 | 2 | $5\frac{1}{4}$ | ,, | 35 | 7 | } |
| 217 | 8 | 10 | ,, | 128 | 7 | 8 segmt. |
| 25 | 2 | | $2\frac{9}{16}$ | 29 | 7 | } |
| 26 | 5 | 2 | ,, | 75 | 7 | } |
| 32 | 2 | 7 | ,, | 37 | 7 | } |
| 33 | 5 | 2 | ,, | 75 | 7 | } |
| 185 | 3 | $6\frac{1}{2}$ | ,, | 52 | $7\frac{1}{2}$ | } |
| 184 | 11 | $4\frac{1}{2}$ | ,, | 170 | $7\frac{1}{2}$ | } 16 segmt. |

| No. | Diameter. | | Pitch. | No. Cogs. | Length of Cogs. | |
|---|---|---|---|---|---|---|
| | Ft. | In. | Inches. | | Inches. | |
| 5 | 1 | 8 | $2\frac{1}{2}$ | 25 | $6\frac{1}{2}$ | |
| 6 | 9 | 11 | ,, | 150 | $6\frac{1}{2}$ | { 6 segmt. 13 cogs. { 6  do.  12  do. |
| 7 | 4 | $4\frac{1}{2}$ | ,, | 66 | $5\frac{1}{2}$ | |
| 8 | 1 | 4 | ,, | 20 | $5\frac{1}{2}$ | |
| 9 | 1 | $4\frac{1}{2}$ | ,, | 20 | $6\frac{1}{2}$ | |
| 150 | 4 | 6 | ,, | 68 | 5 | mortise. |
| 151 | 2 | 3 | ,, | 34 | 5 | |
| 152 | 2 | 6 | ,, | 38 | 5 | |
| 153 | 1 | $6\frac{1}{2}$ | ,, | 23 | 5 | |
| 101 | 3 | 7 | ,, | 53 | 6 | |
| 102 | 2 | 4 | ,, | 35 | 6 | |
| 50 | 2 | $4\frac{1}{2}$ | ,, | 36 | 6 | |
| 51 | 12 | $9\frac{1}{2}$ | ,, | 192 | 6 | 16 segmt. |
| 15 | 3 | $5\frac{1}{2}$ | $2\frac{7}{16}$ | 53 | $5\frac{1}{2}$ | |
| 16 | 11 | 3 | ,, | 176 | $5\frac{1}{2}$ | 16 segmt. |

| No. | Diameter. | | Pitch. | No. Cogs. | Length of Cogs. | |
|---|---|---|---|---|---|---|
| | Ft. | In. | Inches. | | Inches. | |
| 11 | 3 | $9\frac{1}{2}$ | $2\frac{3}{8}$ | 60 | 6 | |
| 12 | 2 | $1\frac{1}{4}$ | ,, | 32 | 6 | |
| 13 | 3 | $6\frac{5}{8}$ | ,, | 56 | 7 | |
| 14 | 9 | 2 | ,, | 154 | 7 | 16 segmt. |
| 17 | 3 | $3\frac{1}{2}$ | ,, | 51 | $7\frac{1}{4}$ | |
| 18 | 10 | 3 | ,, | 160 | $7\frac{1}{4}$ | 16 segmt. |
| 19 | 2 | $4\frac{3}{4}$ | ,, | 37 | $5\frac{1}{2}$ | |
| 20 | 10 | | ,, | 156 | $5\frac{1}{2}$ | 12 segmt. |
| 21 | 3 | $\frac{1}{2}$ | ,, | 48 | 3 | |
| 22 | | 10 | ,, | 13 | 3 | mortise. |
| 218 | 5 | 5 | ,, | 85 | 6 | |
| 219 | 2 | $1\frac{1}{4}$ | ,, | 33 | 6 | |

| No. | Diameter. | | Pitch. | No. Cogs. | Length of Cogs. | | |
|---|---|---|---|---|---|---|---|
| | Ft. | In. | Inches. | | Inches. | | |
| 30 | 2 | 11½ | 2$\frac{5}{16}$ | 32 | 6 | } | |
| 31 | 8 | | ,, | 132 | 6 | } | 12 segmt. |
| | | | | | | | |
| 36 | 3 | 1¼ | 2¼ | 52 | 5 | } | |
| 37 | 2 | 1 | ,, | 35 | 5 | } | |
| 38 | 15 | 7 | ,, | 156 | 5 | } | 16 segmt. |
| 39 | 2 | 4 | ,, | 38 | 5 | } | |
| 35 | 4 | 3½ | ,, | 72 | 7 | } | mortise. |
| 34 | 1 | 9½ | ,, | 30 | 7 | } | |
| 220 | 2 | 6 | ,, | 42 | 4¾ | } | |
| 221 | 2 | 1 | ,, | 34 | 4¾ | } | |
| | | | | | | | |
| 40 | 2 | ⅛ | 2⅛ | 36 | 4 | } | |
| 41 | 10 | | ,, | 180 | 4 | } | 12 segmt. |

| No. | Diameter | | Pitch. | No. Cogs. | Length of Cogs. | |
|---|---|---|---|---|---|---|
| | Ft. | In. | Inches. | | Inches. | |
| 46 | 1 | $6\frac{1}{8}$ | $2\frac{1}{16}$ | 27 | 4 | } 12 segmt. |
| 47 | 9 | | ,, | 168 | 4 | |
| 178 | 1 | $3\frac{3}{4}$ | 2 | 24 | $4\frac{1}{2}$ | } |
| 177 | 3 | $10\frac{1}{2}$ | ,, | 72 | $4\frac{1}{2}$ | } 6 segmt. |
| 54 | 4 | $\frac{3}{4}$ | ,, | 76 | 5 | } |
| 55 | 2 | $1\frac{1}{2}$ | ,, | 38 | 5 | } |
| 56 | 3 | $4\frac{3}{4}$ | ,, | 64 | 5 | } |
| 57 | 2 | 6 | ,, | 47 | 5 | } |
| 58 | 4 | 10 | ,, | 91 | 6 | } mortise. |
| 95 | 1 | $7\frac{1}{2}$ | ,, | 30 | 6 | } |
| 60 | 8 | 3 | ,, | 156 | 5 | } 12 segmt. |
| 61 | 1 | $7\frac{1}{4}$ | ,, | 30 | 5 | } |

| No. | Diameter. | | Pitch. | No. Cogs. | Length of Cogs. | |
|---|---|---|---|---|---|---|
| | Ft. | In. | Inches. | | Inches. | |
| 53 | 3 | $\frac{1}{4}$ | 2 | 56 | 5 | ⎫ mortise. |
| 52 | 1 | 1 | ,, | 20 | 5 | ⎬ |
| 222 | 3 | $\frac{1}{4}$ | ,, | 56 | 5 | ⎪ |
| 223 | 1 | 1 | ,, | 20 | 5 | ⎭ |
| 70 | 1 | 8 | ,, | 32 | 6 | ⎫ |
| 71 | 2 | 6 | ,, | 48 | 6 | ⎬ mortise. |
| 42 | 1 | $7\frac{3}{4}$ | ,, | 31 | $5\frac{1}{2}$ | ⎫ |
| 43 | 4 | 2 | ,, | 76 | $5\frac{1}{2}$ | ⎬ mortise. |
| 191 | 3 | $\frac{3}{8}$ | ,, | 57 | 6 | ⎫ |
| 192 | 2 | 8 | ,, | 50 | 6 | ⎬ |
| 197 | 4 | $8\frac{7}{8}$ | ,, | 88 | 7 | ⎫ mortise. |
| 198 | 2 | $5\frac{1}{8}$ | ,, | 45 | 7 | ⎬ |
| 224 | 3 | $1\frac{3}{4}$ | ,, | 60 | 7 | ⎫ mortise. |
| 225 | 2 | $5\frac{1}{2}$ | ,, | 46 | 7 | ⎬ |
| 226 | 2 | $3\frac{1}{2}$ | ,, | 42 | 5 | ⎫ |
| 227 | 1 | 6 | ,, | 27 | 5 | ⎭ |

| No. | Diameter. | | Pitch. | No. Cogs. | Length of Cogs. |
|---|---|---|---|---|---|
| | Ft. | In. | Inches. | | Inches. |
| 48 | 3 | 3¾ | 1$\frac{15}{16}$ | 64 | 3⅞ ⎫ |
| 49 | | 10 | ,, | 16 | 3⅞ ⎭ |
| | | | | | |
| 62 | 1 | 7¼ | 1⅞ | 32 | 5½ ⎫ |
| 63 | 10 | 9 | ,, | 216 | 5½ ⎬ 18 segmt. |
| 64 | 5 | 6 | ,, | 110 | 4 |
| 65 | | 8 | ,, | 13 | 5 |
| 44 | 2 | 2¼ | ,, | 43 | 6 |
| 45 | 8 | 7 | ,, | 171 | 6 ⎭ |

| No. | Diameter. | | Pitch. | No. Cogs. | Length of Cogs. | |
| --- | --- | --- | --- | --- | --- | --- |
| | Ft. | In. | Inches. | | Inches. | |
| 180 | 1 | $4\frac{1}{2}$ | $1\frac{13}{16}$ | 28 | 5 | ) |
| 179 | 4 | $\frac{1}{2}$ | ,, | 84 | 5 | ) |
| 199 | 4 | $9\frac{3}{4}$ | $1\frac{3}{4}$ | 102 | 5 | ) mortise. |
| 200 | 1 | $4\frac{3}{8}$ | ,, | 29 | 5 | ) |
| 193 | 5 | | ,, | 110 | $3\frac{3}{4}$ | ) |
| 194 | 1 | | ,, | 22 | $3\frac{3}{4}$ | ) |
| 68 | 3 | $5\frac{3}{4}$ | ,, | 75 | $4\frac{3}{4}$ | ) |
| 69 | 1 | $6\frac{3}{4}$ | ,, | 33 | $4\frac{3}{4}$ | ) |
| 232 | 3 | $6\frac{3}{8}$ | ,, | 75 | $4\frac{1}{2}$ | ) |
| 233 | 1 | $2\frac{3}{16}$ | ,, | 25 | $4\frac{1}{2}$ | ) |
| 234 | 3 | 1 | ,, | 66 | 5 | ) mortise. |
| 235 | 1 | $9\frac{1}{2}$ | ,, | 38 | 5 | ) |
| 236 | 3 | 1 | ,, | 66 | 5 | ) mortise. |
| 237 | 1 | $6\frac{1}{2}$ | ,, | 33 | 5 | ) |
| 238 | 1 | 7 | ,, | 33 | 4 | ) |
| 239 | 1 | $3\frac{1}{2}$ | ,, | 27 | 4 | ) |

| No. | Diameter. | | Pitch. | No. Cogs. | Length of Cogs. |
|---|---|---|---|---|---|
| | Ft. | In. | Inches. | | Inches. |
| 248 | 3 | $6\frac{1}{2}$ | $1\frac{3}{4}$ | 75 | $4\frac{1}{2}$ } |
| 249 | 1 | | ,, | 21 | $4\frac{1}{2}$ } |
| 72 | 2 | | $1\frac{11}{16}$ | 44 | 3 } |
| 73 | 1 | $5\frac{3}{4}$ | ,, | 33 | 3 } |

| No. | Diameter. | | Pitch. | No. Cogs. | Length of Cogs. | |
|---|---|---|---|---|---|---|
| | Ft. | In. | Inches. | | Inches. | |
| 76 | ·3 | | $1\frac{5}{8}$ | 68 | 4 | |
| 77 | 1 | $5\frac{1}{2}$ | ,, | 33 | 4 | |
| 78 | 1 | $7\frac{1}{2}$ | ,, | 37 | 4 | |
| 79 | 2 | $10\frac{1}{4}$ | ,, | 66 | $3\frac{3}{4}$ | |
| 80 | 2 | $4\frac{5}{8}$ | ,, | 55 | $3\frac{3}{4}$ | |
| 81 | 6 | $3\frac{1}{2}$ | ,, | 144 | 3 | 8 segmt. |
| 82 | | $19\frac{3}{4}$ | ,, | 37 | 3 | |
| 195 | 2 | 8 | ,, | 62 | 5 | |
| 196 | 1 | 1 | ,, | 25 | 5 | |
| 205 | 1 | 10 | ,, | 42 | 3 | |
| 206 | | 11 | ,, | 21 | 3 | |
| 87 | 5 | | $1\frac{9}{16}$ | 125 | $3\frac{1}{4}$ | |
| 88 | 1 | | ,, | 21 | $3\frac{1}{4}$ | |
| 85 | 5 | | ,, | 120 | $3\frac{1}{4}$ | 6 segmt. |
| 86 | | 10 | ,, | 20 | $3\frac{1}{2}$ | |
| 188 | 2 | 6 | ,, | 60 | $3\frac{1}{2}$ | |
| 187 | 1 | 8 | ,, | 40 | $3\frac{1}{2}$ | |

| No. | Diameter | | Pitch. | No. Cogs. | Length of Cogs. | |
|---|---|---|---|---|---|---|
| | Ft. | In. | Inches. | | Inches. | |
| 91 | | 9½ | 1½ | 20 | 2¾ | ⎫ |
| 92 | 6 | | ,, | 150 | 2¾ | ⎬ 6 segmt. |
| 93 | 3 | 8⅜ | ,, | 92 | 3¼ | ⎭ |
| 94 | 1 | 8⅝ | ,, | 43 | 3¼ | ⎰ |
| 95 | 8 | 7½ | ,, | 216 | 3¾ | ⎱ 12 segmt. |
| 96 | 1 | 3 | ,, | 31 | 3¾ | |
| 97 | 5 | | ,, | 128 | 3¾ | � 8 segmt. |
| 98 | | 10⅛ | ,, | 21 | 3¾ | |
| 154 | 2 | 1 | ,, | 54 | 3¾ | |
| 155 | 1 | ½ | ,, | 27 | 3⅜ | |
| 160 | 2 | 6 | ,, | 64 | 3 | ⎰ mortise. |
| 161 | 1 | 2½ | ,, | 31 | 3 | ⎱ |
| 240 | 10 | | ,, | 252 | 3¾ | ⎰ 12 segmt. |
| 241 | 1 | | ,, | 25 | 3¾ | ⎱ |

| No. | Diameter | | Pitch. | No. Cogs. | Length of Cogs. |
|---|---|---|---|---|---|
| | Ft. | In. | Inches. | | Inches. |
| 99 | 2 | 6 | $1\frac{7}{16}$ | 64 | 4 } mortise. |
| 100 | 1 | 3 | ,, | 32 | 4 } |
| 105 | 3 | | $1\frac{3}{8}$ | 81 | 3 |
| 106 | 1 | | ,, | 27 | 3 |
| 107 | 1 | 6 | ,, | 41 | $2\frac{3}{4}$ |
| 108 | | 11 | ,, | 25 | $2\frac{3}{4}$ |
| 109 | 1 | $3\frac{1}{4}$ | ,, | 35 | $2\frac{7}{8}$ |
| 110 | 1 | $\frac{1}{8}$ | ,, | 28 | $2\frac{7}{8}$ |
| 111 | 4 | | ,, | 112 | $3\frac{3}{8}$ |
| 112 | 1 | | ,, | 28 | $3\frac{3}{4}$ |
| 113 | 2 | 8 | ,, | 72 | $3\frac{1}{4}$ |
| 114 | | 8 | ,, | 18 | $3\frac{1}{4}$ |
| 115 | 1 | 6 | ,, | 40 | 3 |
| 116 | 1 | $3\frac{3}{4}$ | ,, | 35 | 3 |
| 242 | 1 | 6 | ,, | 40 | 3 } mortise. |
| 258 | 1 | $2\frac{1}{2}$ | ,, | 33 | 3 |
| 259 | | $7\frac{1}{4}$ | ,, | 16 | 3 |

| No. | Diameter. | | Pitch. | No. Cogs. | Length of Cogs. | |
|---|---|---|---|---|---|---|
| | Ft. | In. | Inches. | | Inches. | |
| 156 | 2 | 6 | $1\frac{5}{16}$ | 72 | $3\frac{1}{4}$ | ⎫ |
| 157 | 1 | 3 | ,, | 36 | $3\frac{1}{4}$ | ⎬ |
| 117 | 2 | $\frac{1}{4}$ | $1\frac{1}{4}$ | 60 | $2\frac{3}{4}$ | ⎫ |
| 118 | | $9\frac{5}{8}$ | ,, | 24 | $2\frac{3}{4}$ | ⎬ |
| 119 | 17 | 9 | ,, | 528 | 3 | 24 segmt. |
| 120 | 1 | 2 | ,, | 34 | 3 | ⎬ |
| 121 | 5 | 6 | ,, | 166 | $4\frac{7}{8}$ | ⎫ |
| 122 | | 6 | ,, | 15 | $4\frac{7}{8}$ | ⎬ |
| $123\frac{1}{2}$ | 10 | 1 | ,, | 304 | 3 | 16 segmt. |
| $124\frac{1}{2}$ | 1 | | ,, | 30 | 3 | ⎬ |
| $125\frac{1}{2}$ | 8 | 6 | ,, | 126 | 3 | 16 segmt. |
| $126\frac{1}{2}$ | 1 | 3 | ,, | 38 | 3 | ⎬ |

E

| No. | Diameter. | | Pitch. | No. Cogs. | Length of Cogs. |
|---|---|---|---|---|---|
| | Ft. | In. | Inches. | | Inches. |
| 158 | 1 | 1 | $1\frac{1}{4}$ | 32 | $2\frac{3}{8}$ ⎞ |
| 159 | | $6\frac{1}{2}$ | ,, | 16 | $2\frac{1}{8}$ ⎟ |
| 162 | 2 | $1\frac{1}{4}$ | ,, | 60 | $3\frac{1}{2}$ ⎟ |
| 163 | | $5\frac{1}{2}$ | ,, | 13 | $3\frac{1}{2}$ ⎟ |
| 254 | 1 | $\frac{1}{8}$ | ,, | 30 | $2\frac{1}{4}$ ⎟ |
| 255 | | $9\frac{1}{8}$ | ,, | 23 | $2\frac{1}{2}$ ⎟ |
| 252 | | 10 | ,, | 30 | $2\frac{1}{4}$ ⎟ |
| 253 | | $5\frac{1}{8}$ | ,, | 15 | $2\frac{1}{4}$ ⎠ |
| 165 | 12 | | $1\frac{3}{16}$ | 404 | $2\frac{3}{4}$ ⎞ 16 segmt. |
| 166 | 1 | 2 | ,, | 37 | $2\frac{3}{4}$ ⎟ |
| 250 | 1 | 3 | ,, | 40 | $2\frac{3}{8}$ ⎟ |
| 251 | | $6\frac{1}{8}$ | ,, | 16 | $2\frac{3}{8}$ ⎠ |

| No. | Diameter | | Pitch. | No. Cogs. | Length of Cogs. |
|---|---|---|---|---|---|
| | Ft. | In. | Inches. | | Inches. |
| 123 | 2 | 7½ | 1⅛ | 86 | 2⅜ |
| 124 | 1 | 7 | ,, | 51 | 2⅝ |
| 125 | 2 | | ,, | 66 | 3¼ |
| 126 | 1 | | ,, | 33 | 3¼ |
| 167 | 2 | 8¼ | ,, | 88 | 3 |
| 168 | | 5⅞ | ,, | 16 | 3 |
| 243 | 1 | 2¾ | ,, | 41 | 2¼ |
| 244 | | 4¼ | ,, | 12 | 2¼ |
| 127 | 2 | 4½ | 1 1/16 | 81 | 3⅛ |
| 128 | | 9½ | ,, | 27 | 3¾ |
| 27 | 1 | 6¼ | ,, | 54 | 2⅜ |
| 28 | | 9¼ | ,, | 27 | 2¾ |

| No. | Diameter | | Pitch. | No. Cogs. | Length of Cogs. |
|---|---|---|---|---|---|
| | Ft. | In. | Inches. | | Inches. |
| 129 | 2 | 2¼ | 1 | 85 | 2½ |
| 130 | | 6½ | ,, | 21 | 2¼ |
| 169 | 2 | 4½ | ,, | 88 | 3 |
| 170 | | 7 | ,, | 22 | 3 |
| 141 | 1 | 3¼ | 7/8 | 54 | 2½ |
| 142 | | 7⅝ | ,, | 27 | 2¼ |
| 143 | 1 | 2¾ | ¾ | 60 | 1⅛ |
| 144 | | 4⅞ | ,, | 20 | 1⅛ |

| No. | Diameter. | | Pitch. | No. Cogs. | Length of Cogs. |
|-----|-----|-----|--------|-----------|-----------------|
| | Ft. | In. | Inches. | | Inches. |
| 172 | | $6\frac{7}{8}$ | $\frac{3}{4}$ | 28 | $2\frac{1}{4}$ |
| 171 | 1 | $8\frac{1}{2}$ | ,, | 84 | $2\frac{1}{4}$ |
| 256 | 2 | 2 | ,, | 108 | $2\frac{1}{4}$ |
| 257 | | $6\frac{1}{2}$ | ,, | 27 | $2\frac{1}{4}$ |

| No. | Diameter. | | Pitch. | No. Cogs. | Length of Cogs. |
|---|---|---|---|---|---|
| | Ft. | In. | Inches. | | Inches. |

| No. | Diameter. | | Pitch. | No. Cogs. | Length of Cogs. |
|---|---|---|---|---|---|
| | Ft. | In. | Inches. | | Inches. |
| 45 | 3 | $1\frac{3}{4}$ | $4\frac{1}{2}$ | 26 | $9\frac{1}{2}$ |
| 46 | 3 | $2\frac{5}{8}$ | $3\frac{5}{8}$ | 34 | $9\frac{1}{2}$ |
| 3 | 3 | 10 | $2\frac{3}{4}$ | 52 | 8 |
| 19 | 2 | 6 | $2\frac{5}{8}$ | 35 | 7 |
| 40 | 3 | 1 | ,, | 44 | 8 |

| No. | Diameter. | | Pitch. | No. Cogs. | Length of Cogs. |
|---|---|---|---|---|---|
| | Ft. | In. | Inches. | | Inches. |
| 1 | 1 | 8 | $2\frac{1}{2}$ | 25 | 5 |
| 2 | 1 | $6\frac{1}{2}$ | $2\frac{1}{4}$ | 25 | $5\frac{1}{2}$ |
| 28 | 1 | 10 | $2\frac{1}{8}$ | 32 | 6    mortise. |
| 33 | 1 | 10 | ,, | 32 | 6 |

| No. | Diameter | | Pitch. | No. Cogs. | Length of Cogs. | |
|---|---|---|---|---|---|---|
| | Ft. | In. | Inches. | | Inches. | |
| 4 | 2 | $11\frac{3}{8}$ | 2 | 53 | $4\frac{3}{4}$ | |
| 6 | 3 | $7\frac{3}{4}$ | ,, | 69 | $4\frac{3}{4}$ | |
| 7 | 2 | $1\frac{1}{4}$ | ,, | 40 | 4 | |
| 8 | 3 | | ,, | 55 | 6 | |
| 9 | 3 | | ,, | 56 | 6 | mortise. |
| 5 | 1 | $\frac{1}{2}$ | ,, | 19 | 5 | |
| 41 | 2 | 6 | ,, | 47 | $5\frac{1}{2}$ | |
| 42 | 2 | $6\frac{5}{8}$ | ,, | 48 | $5\frac{1}{2}$ | mortise. |
| 11 | 2 | $\frac{5}{8}$ | $1\frac{15}{16}$ | 40 | $4\frac{1}{8}$ | mortise. |

| No. | Diameter. | | Pitch. | No. Cogs. | Length of Cogs. |
|---|---|---|---|---|---|
| | Ft. | In. | Inches. | | Inches. |
| 12 | 1 | $3\frac{1}{4}$ | $1\frac{3}{4}$ | 27 | 4 |
| 13 | 3 | 4 | ,, | 71 | $4\frac{1}{2}$ |
| 50 | 2 | 6 | ,, | 54 | 4 |
| 14 | 1 | $\frac{1}{2}$ | $1\frac{1}{2}$ | 26 | $2\frac{7}{8}$ |
| 15 | 2 | $5\frac{1}{2}$ | ,, | 63 | $2\frac{3}{16}$ |
| 18 | 2 | | ,, | 50 | $3\frac{1}{2}$ |
| 16 | 1 | $\frac{1}{4}$ | $1\frac{7}{16}$ | 27 | $3\frac{5}{8}$ |
| 17 | 1 | $4\frac{3}{4}$ | ,, | 37 | 3 |

| No. | Diameter. | | Pitch. | No. Cogs. | Length of Cogs. |
|-----|-----------|-----|--------|-----------|------------------|
|  | Ft. | In. | Inches. | | Inches. |
| 23 | 1 | 9 | $1\frac{5}{8}$ | 39 | 4 |
| 24 | 1 | $8\frac{1}{2}$ | ,, | 40 | 4 mortise. |
| 47 | 1 | 10 | ,, | 41 | 4 |
| 20 | 1 | | $1\frac{3}{8}$ | 28 | 3 |
| 43 | 1 | 4 | $1\frac{1}{4}$ | 40 | 3 |
| 21 | 1 | 8 | ,, | 50 | $3\frac{1}{8}$ |

| No. | Diameter. | | Pitch. | No. Cogs. | Length of Cogs. |
|---|---|---|---|---|---|
| | Ft. | In. | Inches. | | Inches. |
| 22 | 1 | $\frac{5}{8}$ | $1\frac{1}{4}$ | 31 | $1\frac{3}{4}$ |
| 25 | 1 | 3 | $1\frac{1}{8}$ | 42 | $2\frac{1}{4}$ |
| 26 | 1 | 2 | ,, | 39 | $2\frac{1}{4}$ |
| 27 | 1 | 6 | ,, | 50 | $3\frac{1}{4}$ |
| 29 | 1 | 7 | 1 | 59 | $2\frac{7}{8}$ |
| 36 | 1 | $5\frac{3}{4}$ | $\frac{15}{16}$ | 58 | $2\frac{1}{8}$ |
| 38 | | 10 | $\frac{7}{8}$ | 34 | $2\frac{3}{4}$ |

| No. | Diameter. | | Pitch. | No. Cogs. | Length of Cogs. |
|-----|-----|-----|-----|-----|-----|
| | Ft. | In. | Inches. | | Inches. |
| 39 | | 6 | $\frac{7}{8}$ | 22 | $1\frac{1}{4}$ |
| 30 | | 9 | $\frac{3}{4}$ | 38 | $1\frac{5}{8}$ |
| 31 | | $8\frac{5}{8}$ | ,, | 36 | $1\frac{3}{16}$ |
| 44 | | $9\frac{5}{8}$ | ,, | 40 | $1\frac{3}{4}$ |
| 32 | 1 | | $\frac{1}{2}$ | 78 | $1\frac{1}{4}$ |
| 34 | | $5\frac{3}{8}$ | $\frac{3}{8}$ | 45 | $\frac{5}{8}$ |
| 35 | | $3\frac{7}{8}$ | ,, | 30 | $\frac{5}{8}$ |

| No. | Diameter. | | Pitch. | No. Cogs. | Length of Cogs. |
|---|---|---|---|---|---|
| | Ft. | In. | Inches. | | Inches. |
| 1 | Rack. | | $2\frac{1}{8}$ | 14 | $2\frac{1}{2}$ |
| 2 | | $11\frac{1}{8}$ | ,, | 16 | 3 |
| 30 | Rack. | | $1\frac{3}{4}$ | 22 | $3\frac{5}{8}$ |
| 210 | 1 | $1\frac{5}{8}$ | ,, | 24 | $3\frac{5}{8}$ |
| 3 | Rack. | | $1\frac{1}{8}$ | 31 | 3 |
| 4 | | $4\frac{7}{8}$ | ,, | 13 | 3 |
| 5 | Rack. | | ,, | 72 | $2\frac{1}{4}$ |
| 6 | | $6\frac{3}{4}$ | ,, | 18 | $2\frac{3}{8}$ |
| 7 | | $3\frac{3}{8}$ | ,, | 9 | $2\frac{3}{8}$ |
| 8 | Rack. | | ,, | 18 | 4 |
| 4 | | $4\frac{7}{8}$ | ,, | 13 | 3 |

| No. | Diameter. | Pitch. | No. Cogs. | Length of Cogs. |
|---|---|---|---|---|
| | Ft. In. | Inches. | | Inches. |
| 33 | Rack. | $1\frac{1}{8}$ | 22 | $2\frac{1}{2}$ |
| 34 | Rack. | ,, | 16 | 3 |
| 35 | $4\frac{3}{8}$ | ,, | 12 | $2\frac{7}{8}$ |
| 36 | $4\frac{1}{2}$ | ,, | 12 | $2\frac{3}{4}$ |
| 37 | $3\frac{3}{4}$ | ,, | 10 | $3\frac{1}{4}$ |
| 38 | $3\frac{1}{2}$ | ,, | 10 | $2\frac{7}{8}$ |
| 9 | Rack. | 1 | 20 | $1\frac{5}{8}$ |
| 10 | $3\frac{3}{8}$ | ,, | 10 | $1\frac{5}{8}$ |
| 41 | Rack. | ,, | 65 | $1\frac{1}{2}$ |
| 42 | $3\frac{7}{8}$ | ,, | 12 | $1\frac{1}{2}$ |
| 43 | 3 | ,, | 10 | $1\frac{5}{8}$ |
| 44 | $2\frac{7}{8}$ | ,, | 9 | 2 |
| 15 | Rack. | $\frac{3}{4}$ | 33 | $1\frac{1}{2}$ |
| 16 | $2\frac{3}{8}$ | ,, | 10 | $1\frac{3}{8}$ |

| No. | Diameter | | Pitch. | No. Cogs. | Length of Cogs. |
|---|---|---|---|---|---|
| | Ft. | In. | Inches. | | Inches. |
| 11 | Rack. | | $1\frac{1}{16}$ | 53 | $2\frac{1}{4}$ |
| 12 | Rack. | | ,, | 53 | $1\frac{3}{4}$ |
| 13 | | $4\frac{5}{8}$ | ,, | 21 | $1\frac{3}{4}$ |
| 14 | | $2\frac{5}{8}$ | ,, | 12 | $1\frac{3}{4}$ |
| 17 | Rack. | | ,, | 53 | $1\frac{1}{8}$ |
| 18 | | $2\frac{5}{8}$ | ,, | 12 | $1\frac{1}{4}$ |
| 21 | Rack. | | $\frac{5}{8}$ | 40 | $1\frac{1}{8}$ |
| 22 | | $3\frac{1}{8}$ | ,, | 16 | 1 |
| 25 | Rack. | | $\frac{9}{16}$ | 140 | 2 |
| 26 | | 3 | ,, | 18 | $2\frac{1}{4}$ |
| 27 | Rack. | | ,, | 68 | $1\frac{1}{2}$ |
| 28 | | $4\frac{1}{4}$ | ,, | 23 | $1\frac{1}{2}$ |
| 47 | Rack. | | $\frac{5}{16}$ | 157 | 2 |
| 48 | | $3\frac{7}{8}$ | ,, | 38 | 2 |

| No. | Diameter. | | Pitch. | No. Cogs. | Length of Cogs. |
|-----|-----------|-----|--------|-----------|-----------------|
| | Ft. | In. | Inches. | | Inches. |
| 45 | Rack. | | $\frac{3}{8}$ | 138 | $1\frac{1}{4}$ |
| 46 | | $1\frac{1}{2}$ | ,, | 12 | $1\frac{1}{2}$ |

F

| Diameter. | | Face. | Depth. | Lbs. | |
|---|---|---|---|---|---|
| Ft. | In. | Inches. | Inches. | | |
| 4 | 6 | $2\frac{1}{4}$ | $3\frac{7}{8}$ | | Cast-iron arms. |
| 3 | $10\frac{3}{4}$ | $2\frac{1}{2}$ | $3\frac{1}{2}$ | | ,, ,, ,, |
| 3 | 6 | $2\frac{1}{4}$ | $2\frac{1}{2}$ | | ,, ,, ,, |
| 3 | $3\frac{3}{4}$ | 3 | $2\frac{1}{4}$ | | ,, ,, ,, |
| 3 | $\frac{1}{2}$ | $1\frac{1}{4}$ | $1\frac{7}{8}$ | 100 | ,, ,, ,, |
| 2 | $7\frac{3}{4}$ | 2 | $3\frac{3}{8}$ | 200 | ,, ,, ,, |
| 2 | $7\frac{7}{8}$ | $2\frac{1}{2}$ | $1\frac{3}{8}$ | | ,, ,, ,, |
| 2 | 6 | $2\frac{3}{4}$ | $1\frac{1}{4}$ | 60 | ,, ,, ,, |
| 1 | $5\frac{1}{2}$ | $\frac{3}{4}$ | $1\frac{1}{8}$ | | ,, ,, ,, |
| 1 | $5\frac{5}{8}$ | $\frac{1}{2}$ | 1 | | ,, ,, ,, |
| 1 | $2\frac{5}{8}$ | 1 | $1\frac{1}{2}$ | | ,, ,, ,, |
| 1 | | $\frac{3}{4}$ | $\frac{3}{4}$ | | ,, ,, ,, |
| 1 | $\frac{1}{4}$ | $1\frac{3}{8}$ | Round. | | ,, ,, ,, |
| 8 | 1 | $4\frac{1}{2}$ | 6 | 2800 | Wrought-iron arms. |

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| Diameter. | | Lbs. | |
|---|---|---|---|
| Ft. | In. | | |
| 10 | | 2000 | Wrought-iron arms. |
| 9 | | 2450 | ,, ,, ,, |
| 8 | | 1700 | ,, ,, ,, |
| 7 | 2 | 1150 | ,, ,, ,, |
| 6 | 10 | 800 | ,, ,, ,, |
| 5 | | 400 | ,, ,, ,, |
| 5 | 9 | 600 | ,, ,, ,, |
| 5 | 1 | 400 | ,, ,, ,, |
| 4 | 11$\frac{3}{4}$ | 296 | Cast-iron arms. |
| 4 | 7 | 260 | ,, ,, ,, |
| 4 | $\frac{1}{2}$ | 209 | Wrought-iron arms. |
| 4 | $\frac{1}{2}$ | 200 | Cast-iron arms. |
| 4 | | 277 | ,, ,, ,, |
| 3 | | 140 | Wrought-iron arms. |
| 2 | 6 | 63 | Cast-iron arms. |
| 2 | 4 | 128 | Wrought-iron arms. |
| 2 | | 70 | ,, ,, ,, |
| 7 | 6 | 1400 | ,, ,, ,, |
| 3 | 6 | 285 | ,, ,, ,, |
| 4 | | 800 | ,, ,, ,, |
| 2 | 6 | 130 | ,, ,, ,, |
| 2 | | 100 | ,, ,, ,, |

| Diameter. | | Face. | |
|---|---|---|---|
| Ft. | In. | Inches. | |
| 2 | 8 | $2\frac{7}{8}$ | for 1 flat band. |
| 2 | $8\frac{3}{4}$ | $3\frac{1}{4}$ | ,, 1 ,,   ,, |
| 2 | 2 | $2\frac{7}{8}$ | ,, 1 ,,   ,, |
| 2 | 2 | $2\frac{3}{8}$ | ,, 1 ,,   ,, |
| 2 | $1\frac{3}{4}$ | $1\frac{3}{4}$ | ,, 1 ,,   ,, |
| 1 | $11\frac{1}{2}$ | $1\frac{1}{8}$ | ,, 1 ,,   ,, |
| 1 | $10\frac{1}{2}$ | $2\frac{3}{4}$ | ,, 1 ,,   ,, |
| 2 | $\frac{1}{2}$ | $\frac{3}{4}$ | 5 cones for round band. |
| 2 | 7 | $\frac{3}{4}$ | 5 ,,   ,,   ,,   ,, |
| 2 | 4 | $\frac{3}{4}$ | 5 ,,   ,,   ,,   ,, |
| 2 | 2 | $\frac{3}{4}$ | 5 ,,   ,,   ,,   ,, |
| 1 | 8 | $\frac{3}{4}$ | 4 ,,   ,,   ,,   ,, |

| Diameter. | Thickness. | | Diameter. | Thickness. |
|---|---|---|---|---|
| Inches. | Inches. | | Inches. | Inches. |
| 20 | 2¾ | Arms. | 7½ | 1¼ |
| 24 | 3 | | 7½ | 1 |
| 15 | 2 | Arms. | 7 | 2 |
| 12 | 2¼ | | 7 | 1¾ |
| 12 | 1¾ | | 7 | 1½ |
| 11 | 2¼ | | 7 | 1¼ |
| 11 | 2¼ | | 7 | 1 |
| 10½ | 2⅛ | | 6¾ | 1½ |
| 10½ | 1¾ | | 6½ | 1½ |
| 10 | 2 | | 6½ | 1¼ |
| 10 | 1½ | | 6½ | 1 |
| 10 | 1 | | 6½ | 2¼ |
| 9 | 2 | | 6½ | 1⅞ |
| 9 | 1¾ | | 6½ | 1¾ |
| 9 | 1½ | | 6¼ | 1½ |
| 9 | 1¼ | | 6¼ | 1¼ |
| 9 | 1 | | 6 | 2⅛ |
| 8¾ | 1¾ | | 6 | 1¾ |
| 8 | 3 | | 6 | 1½ |
| 8 | 2 | | 6 | 1¼ |
| 8 | 1¾ | | 6 | 1 |
| 8 | 1¼ | | 5¾ | 1¼ |
| 8 | 1 | | | |
| | | | 5½ | 1½ |
| 7½ | 2¼ | | 5½ | 1¼ |
| 7½ | 1¾ | | 5½ | 1 |

# SHIVES.

| Diameter. | Thickness. |  | Diameter. | Thickness. |
| --- | --- | --- | --- | --- |
| Inches. | Inches. |  | Inches. | Inches. |
| 5 | 1½ |  | 3½ | ⅞ |
| 5 | 1¼ |  | 3½ | ¾ |
| 5 | 1⅛ |  | 3¼ | 1 |
| 5 | 1 |  | 3¼ | ⅞ |
| 4¾ | 1½ |  | 3 | 1¼ |
| • 4¾ | 1¼ |  | 3 | 1 |
| 4¾ | 1⅛ |  | 3 | ⅞ |
| 4½ | 2 |  | 2¾ | 1 |
| 4½ | 1¾ |  | 2¾ | ⅞ |
| 4½ | 1½ |  | 2½ | ⅞ |
| 4½ | 1¼ |  |  |  |
| 4½ | 1⅛ |  |  |  |
| 4½ | 1 |  |  |  |
| 4¼ | 1½ |  |  |  |
| 4¼ | 1¼ |  |  |  |
| 4¼ | 1 |  |  |  |
| 4 | 1½ |  |  |  |
| 4 | 1¼ |  |  |  |
| 4 | 1 |  |  |  |
| 3¾ | 1¼ |  |  |  |
| 3¾ | 1 |  |  |  |
| 3¾ | ⅞ |  |  |  |
| 3¾ | ¾ |  |  |  |
| 3½ | 1½ |  |  |  |
| 3½ | 1¼ |  |  |  |
| 3½ | 1 |  |  |  |

| Diam. | Face. | | Weight. | Diam. | | Face. | | Weight. | |
|---|---|---|---|---|---|---|---|---|---|
| Feet. | Ft. | In. | | Ft. | In. | Ft. | In. | | |
| 12 | 2 | 4 | | 6 | | 2 | 4 | | |
| 12 | 2 | | | 6 | | 1 | 2 | | |
| 12 | 1 | 9 | 6160 in halves. | 6 | | 1 | | | |
| 10 | 2 | 8 | double band. | 5 | | 1 | 8 | 1730 | { wrought arms. |
| 10 | 2 | 4 | | 5 | | 1 | | 840 | . |
| 10 | 2 | | | 4 | | | 10 | 450 | |
| 10 | 1 | 8 | | | | | | | |
| 9 | 1 | 8 | | 3 | 6 | | 8 | | |
| | | | | 3 | 6 | | 6 | | |
| 8 | 2 | | | 3 | | 2 | | | |
| 8 | 1 | 8 | 2690 | 3 | | | 8 | | |
| 8 | 1 | 3 | | | | | | | |
| | | | | 2 | 8 | | 6 | 250 | |
| 7 | 2 | | | 2 | 6 | | 6 | 300 | |
| 7 | 1 | 6 | | 2 | | | 6 | | |
| 7 | 1 | 2 | | | | | | | |
| 7 | 1 | | | | | | | | |

| Diam. Ft. | In. | Face Ft. | In. | Weight. | Diam. Ft. | In. | Face Ft. | In. | Weight. |
|---|---|---|---|---|---|---|---|---|---|
| 4 | | 1 | 4 | | 2 | | | 4½ | |
| 4 | | 1 | | 400 | 2 | | | 3 | |
| 4 | | | 10½ | | 1 | 10 | | 6 | |
| 3 | 6 | 1 | | | 1 | 9 | | 9 | |
| 3 | 6· | | 10 | | 1 | 8¾ | | 2½ | |
| 3 | 6 | | 6 | | 1 | 8 | | 8 | |
| 3 | | 2 | | | 1 | 8 | | 7 | in halves. |
| 3 | | 1 | 2 | 300 {strong arms. | 1 | 8 | | 6 | |
| 3 | | | 10 | 210 | 1 | 8 | | 4 | |
| 3 | | | 8 | 225 | 1 | 6 | 1 | 3 | |
| 3 | | | 6 | 120 | 1 | 6 | | 8 | |
| 3 | | | 7 | in halves. | 1 | 6 | | 6 | |
| 2 | 8 | | 6 | | 1 | 6 | | 4 | |
| 2 | 9 | | 8¼ | | 1 | 6 | | 3½ | |
| 2 | 6 | 2 | | {strong pattern. | 1 | 5 | | 6 | |
| 2 | 6 | | 10 | | 1 | 4 | | 9 | |
| 2 | 6 | | 7 | in halves. | 1 | 4 | | 7 | |
| 2 | 6 | | 6 | | 1 | 4 | | 7 | in halves. |
| 2 | 6 | | 4½ | | 1 | 4 | | 6 | |
| 2 | 4 | | 6 | | 1 | 4 | | 4½ | |
| 2 | 2 | | 6 | | 1 | 4 | | 3½ | |
| 2 | | 1 | | | 1 | 4 | | 2 | |
| 2 | | | 10 | | 1 | 3 | | 3 | |
| 2 | | | 8 | | 1 | 2⅞ | | 2⅜ | |
| 2 | | | 7 | in halves. | 1 | 2½ | | 2⅝ | |
| 2 | | | 6 | | 1 | 2 | | 10 | |
| 2 | | | 5 | | 1 | 2 | | 6 | |
| | | | | | 1 | 2 | | 4½ | |

| Diam. | | Face. | | Weight. | Diam. | Face. | Weight. |
|---|---|---|---|---|---|---|---|
| Ft. | In. | Ft. | In. | | Inches. | Inches. | |
| 1 | 2 | | 2⅜ | | 10 | 3 | |
| 1 | 1 | | 6 | | 10 | 2⅝ | |
| 1 | 1 | | 3⅞ | | 9⅜ | 6 | |
| 1 | | 1 | | | 9 | 8½ | in halves. |
| 1 | | | 8 | | 9 | 8⅛ | |
| 1 | | | 7 | in halves. | 9 | 2½ | |
| 1 | | | 6 | | 8¼ | 3 | |
| 1 | | | 5 | | 8 | 10 | |
| 1 | | | 4 | | 8 | 6 | |
| 1 | | | 3 | | 8 | 5 | |
| 1 | | | 2⅜ | | 7 | 7 | |
| 1 | | | 1⅝ | | 7 | 6 | |
| | | | | | 6⅜ | 1⅝ | |
| | 11¾ | | 2⅜ | | 6 | 6 | |
| | 11 | | 8⅛ | | 6 | 4½ | |
| | 11 | | 6 | | 6 | 4 | |
| | 11 | | 3⅜ | | 6 | 2½ | |
| | 10 | | 6 | | 6 | 1⅞ | |
| | 10 | | 4½ | | 5 | 6 | |
| | 10 | | 4 | | 5 | 5 | |
| | 10 | | 10 | | 5 | 2½ | |

NOTE. — We are fitted for making Pulleys of 6, 7, 8, 9, 10, 11, and 12 feet diameter, by sweeping up the rim, instead of the ordinary mode of moulding from a pattern, — thus saving the expense of turning the face. These Pulleys can be varied in thickness, width of rim, and weight.

| Diam. | Area. | Circum. | Diam. | Area. | Circum. |
|---|---|---|---|---|---|
| 1/4 | .049 | .785 | 7 1/2 | 44.179 | 23.562 |
| 1/2 | .196 | 1.571 | 3/4 | 47.173 | 24.347 |
| 3/4 | .442 | 2.356 | 8 | 50.265 | 25.132 |
| 1 | .785 | 3.142 | 1/4 | 53.456 | 25.918 |
| 1/4 | 1.227 | 3.927 | 1/2 | 56.745 | 26.703 |
| 1/2 | 1.767 | 4.712 | 3/4 | 60.132 | 27.489 |
| 3/4 | 2.405 | 5.498 | 9 | 63.617 | 28.274 |
| 2 | 3.142 | 6.283 | 1/4 | 67.200 | 29.060 |
| 1/4 | 3.976 | 7.069 | 1/2 | 70.882 | 29.845 |
| 1/2 | 4.909 | 7.854 | 3/4 | 74.662 | 30.630 |
| 3/4 | 5.940 | 8.639 | 10 | 78.540 | 31.416 |
| 3 | 7.069 | 9.425 | 1/4 | 82.516 | 32.201 |
| 1/4 | 8.296 | 10.210 | 1/2 | 86.590 | 32.987 |
| 1/2 | 9.621 | 10.995 | 3/4 | 90.762 | 33.772 |
| 3/4 | 11.045 | 11.781 | 11 | 95.033 | 34.558 |
| 4 | 12.566 | 12.566 | 1/4 | 99.402 | 35.343 |
| 1/4 | 14.186 | 13.351 | 1/2 | 103.869 | 36.128 |
| 1/2 | 15.904 | 14.137 | 3/4 | 108.434 | 36.913 |
| 3/4 | 17.720 | 14.922 | 12 | 113.097 | 37.699 |
| 5 | 19.635 | 15.708 | 1/4 | 117.859 | 38.484 |
| 1/4 | 21.647 | 16.493 | 1/2 | 122.718 | 39.270 |
| 1/2 | 23.758 | 17.278 | 3/4 | 127.676 | 40.055 |
| 3/4 | 25.967 | 18.064 | 13 | 132.73 | 40.84 |
| 6 | 28.274 | 18.849 | 1/4 | 137.89 | 41.63 |
| 1/4 | 30.680 | 19.635 | 1/2 | 143.14 | 42.41 |
| 1/2 | 33.183 | 20.420 | 3/4 | 148.49 | 43.20 |
| 3/4 | 35.785 | 21.205 | 14 | 153.94 | 43.98 |
| 7 | 38.484 | 21.991 | 1/4 | 159.48 | 44.77 |
| 1/4 | 41.282 | 22.776 | 1/2 | 165.13 | 45.55 |

| Diam. | Area. | Circum. | Diam. | Area. | Circum. |
|---|---|---|---|---|---|
| 14¾ | 170.87 | 46.34 | 22 | 380.13 | 69.12 |
| 15 | 176.71 | 47.12 | ¼ | 388.82 | 69.90 |
| ¼ | 182.65 | 47.91 | ½ | 397.61 | 70.69 |
| ½ | 188.69 | 48.69 | ¾ | 406.49 | 71.47 |
| ¾ | 194.83 | 49.48 | 23 | 415.48 | 72.26 |
| 16 | 201.06 | 50.27 | ¼ | 424.56 | 73.04 |
| ¼ | 207.39 | 51.05 | ½ | 433.74 | 73.83 |
| ½ | 213.82 | 51.84 | ¾ | 443.01 | 74.61 |
| ¾ | 220.35 | 52.62 | 24 | 452.39 | 75.40 |
| 17 | 226.98 | 53.41 | ¼ | 461.86 | 76.18 |
| ¼ | 233.70 | 54.19 | ½ | 471.44 | 76.97 |
| ½ | 240.53 | 54.98 | ¾ | 481.11 | 77.75 |
| ¾ | 247.45 | 55.76 | 25 | 490.87 | 78.54 |
| 18 | 254.47 | 56.55 | ¼ | 500.74 | 79.33 |
| ¼ | 261.59 | 57.33 | ½ | 510.71 | 80.11 |
| ½ | 268.80 | 58.12 | ¾ | 520.77 | 80.90 |
| ¾ | 276.12 | 58.90 | 26 | 530.93 | 81.68 |
| 19 | 283.53 | 59.69 | ¼ | 541.19 | 82.47 |
| ¼ | 291.04 | 60.48 | ½ | 551.55 | 83.25 |
| ½ | 298.65 | 61.26 | ¾ | 562.00 | 84.04 |
| ¾ | 306.35 | 62.05 | 27 | 572.56 | 84.82 |
| 20 | 314.16 | 62.83 | ¼ | 583.21 | 85.61 |
| ¼ | 322.06 | 63.62 | ½ | 593.96 | 86.39 |
| ½ | 330.06 | 64.40 | ¾ | 604.81 | 87.18 |
| ¾ | 338.16 | 65.19 | 28 | 615.75 | 87.96 |
| 21 | 346.36 | 65.97 | ¼ | 626.80 | 88.75 |
| ¼ | 354.66 | 66.76 | ½ | 637.94 | 89.54 |
| ½ | 363.05 | 67.54 | ¾ | 649.18 | 90.32 |
| ¾ | 371.54 | 68.33 | 29 | 660.52 | 91.11 |

| Diam. | Area. | Circum. | Diam. | Area. | Circum. |
|---|---|---|---|---|---|
| 29¼ | 671.96 | 91.89 | 36½ | 1046.35 | 114.67 |
| ½ | 683.49 | 92.68 | ¾ | 1060.73 | 115.45 |
| ¾ | 695.13 | 93.46 | 37 | 1075.2 | 116.2 |
| 30 | 706.86 | 94.25 | ¼ | 1089.8 | 117.0 |
| ¼ | 718.69 | 95.03 | ½ | 1104.5 | 117.8 |
| ½ | 730.62 | 95.82 | ¾ | 1119.2 | 118.6 |
| ¾ | 742.64 | 96.60 | 38 | 1134.1 | 119.4 |
| 31 | 754.77 | 97.39 | ¼ | 1149.1 | 120.2 |
| ¼ | 766.99 | 98.17 | ½ | 1164.2 | 121.0 |
| ½ | 779.31 | 98.97 | ¾ | 1179.3 | 121.7 |
| ¾ | 791.73 | 99.75 | 39 | 1194.6 | 122.5 |
| 32 | 804.25 | 100.53 | ¼ | 1210.0 | 123.3 |
| ¼ | 816.86 | 101.32 | ½ | 1225.4 | 124.1 |
| ½ | 829.58 | 102.10 | ¾ | 1241.0 | 124.9 |
| ¾ | 842.39 | 102.89 | 40 | 1256.6 | 125.6 |
| 33 | 855.30 | 103.67 | ¼ | 1272.4 | 126.4 |
| ¼ | 868.30 | 104.46 | ½ | 1288.2 | 127.2 |
| ½ | 881.41 | 105.24 | ¾ | 1304.2 | 128.0 |
| ¾ | 894.62 | 106.03 | 41 | 1320.3 | 128.8 |
| 34 | 907.92 | 106.81 | ¼ | 1336.4 | 129.6 |
| ¼ | 921.32 | 107.60 | ½ | 1352.7 | 130.4 |
| ½ | 934.82 | 108.39 | ¾ | 1369.0 | 131.2 |
| ¾ | 948.42 | 109.17 | 42 | 1385.4 | 131.9 |
| 35 | 962.11 | 109.96 | ¼ | 1402.0 | 132.7 |
| ¼ | 975.91 | 110.74 | ½ | 1418.6 | 133.5 |
| ½ | 989.80 | 111.53 | ¾ | 1435.4 | 134.3 |
| ¾ | 1003.79 | 112.31 | 43 | 1452.2 | 135.1 |
| 36 | 1017.88 | 113.10 | ¼ | 1469.1 | 135.9 |
| ¼ | 1032.06 | 113.88 | ½ | 1486.2 | 136.7 |

| Diam. | Area. | Circum. | Diam. | Area. | Circum. |
|---|---|---|---|---|---|
| 43¾ | 1503.3 | 137.4 | 51 | 2042.8 | 160.2 |
| 44 | 1520.5 | 138.2 | ¼ | 2062.9 | 161.0 |
| ¼ | 1537.9 | 139.0 | ½ | 2083.1 | 161.8 |
| ½ | 1555.3 | 139.8 | ¾ | 2103.3 | 162.6 |
| ¾ | 1572.8 | 140.6 | 52 | 2123.7 | 163.4 |
| 45 | 1590.4 | 141.4 | ¼ | 2144.2 | 164.1 |
| ¼ | 1608.2 | 142.2 | ½ | 2164.8 | 164.9 |
| ½ | 1626.0 | 142.9 | ¾ | 2185.4 | 165.7 |
| ¾ | 1643.9 | 143.7 | 53 | 2206.2 | 166.5 |
| 46 | 1661.9 | 144.5 | ¼ | 2227.0 | 167.3 |
| ¼ | 1680.0 | 145.3 | ½ | 2248.0 | 168.1 |
| ½ | 1698.2 | 146.1 | ¾ | 2269.0 | 168.9 |
| ¾ | 1716.5 | 146.9 | 54 | 2290.2 | 169.6 |
| 47 | 1734.9 | 147.7 | ¼ | 2311.5 | 170.4 |
| ¼ | 1753.5 | 148.4 | ½ | 2332.8 | 171.2 |
| ½ | 1772.1 | 149.2 | ¾ | 2354.3 | 172.0 |
| ¾ | 1790.8 | 150.0 | 55 | 2375.8 | 172.8 |
| 48 | 1809.6 | 150.8 | ¼ | 2397.5 | 173.6 |
| ¼ | 1828.5 | 151.6 | ½ | 2419.2 | 174.4 |
| ½ | 1847.5 | 152.4 | ¾ | 2441.0 | 175.1 |
| ¾ | 1866.5 | 153.2 | 56 | 2463.0 | 175.9 |
| 49 | 1885.7 | 153.9 | ·¼ | 2485.0 | 176.7 |
| ¼ | 1905.0 | 154.7 | ½ | 2507.2 | 177.5 |
| ½ | 1924.4 | 155.5 | ¾ | 2529.4 | 178.3 |
| ¾ | 1943.9 | 156.3 | 57 | 2551.8 | 179.1 |
| 50 | 1963.5 | 157.1 | ¼ | 2574.2 | 179.9 |
| ¼ | 1983.2 | 158.0 | ½ | 2596.7 | 180.6 |
| ½ | 2003.0 | 158.7 | ¾ | 2619.4 | 181.4 |
| ¾ | 2022.8 | 159.4 | 58 | 2642.1 | 182.2 |

| Diam. | Area. | Circum. | Diam. | Area. | Circum. |
|---|---|---|---|---|---|
| 58¼ | 2664.9 | 183.0 | 65½ | 3369.6 | 205.8 |
| ½ | 2687.8 | 183.8 | ¾ | 3395.3 | 206.6 |
| ¾ | 2710.9 | 184.6 | 66 | 3421.2 | 207.3 |
| 59 | 2734.0 | 185.4 | ¼ | 3447.2 | 208.1 |
| ¼ | 2757.2 | 186.1 | ½ | 3473.2 | 208.9 |
| ½ | 2780.5 | 186.9 | ¾ | 3499.4 | 209.7 |
| ¾ | 2803.9 | 187.7 | 67 | 3525.6 | 210.5 |
| 60 | 2827.4 | 188.5 | ¼ | 3552.0 | 211.3 |
| ¼ | 2851.0 | 189.3 | ½ | 3578.5 | 212.1 |
| ½ | 2874.8 | 190.1 | ¾ | 3605.0 | 212.8 |
| ¾ | 2898.5 | 190.9 | 68 | 3631.7 | 213.6 |
| 61 | 2922.5 | 191.6 | ¼ | 3658.4 | 214.4 |
| ¼ | 2946.5 | 192.4 | ½ | 3685.3 | 215.2 |
| ½ | 2970.6 | 193.2 | ¾ | 3712.2 | 215.9 |
| ¾ | 2994.8 | 194.0 | 69 | 3739.3 | 216.7 |
| 62 | 3019.1 | 194.8 | ¼ | 3766.4 | 217.5 |
| ¼ | 3043.5 | 195.6 | ½ | 3793.7 | 218.3 |
| ½ | 3068.0 | 196.3 | ¾ | 3821.0 | 219.1 |
| ¾ | 3092.6 | 197.1 | 70 | 3848.5 | 219.9 |
| 63 | 3117.2 | 197.9 | ¼ | 3876.0 | 220.7 |
| ¼ | 3142.0 | 198.7 | ½ | 3903.6 | 221.5 |
| ½ | 3166.9 | 199.5 | ¾ | 3931.4 | 222.2 |
| ¾ | 3191.9 | 200.3 | 71 | 3959.2 | 223.0 |
| 64 | 3217.0 | 201.1 | ¼ | 3987.1 | 223.8 |
| ¼ | 3242.2 | 201.8 | ½ | 4015.2 | 224.6 |
| ½ | 3267.5 | 202.6 | ¾ | 4043.3 | 225.4 |
| ¾ | 3292.8 | 203.4 | 72 | 4071.5 | 226.2 |
| 65 | 3318.3 | 204.2 | ¼ | 4099.8 | 227.0 |
| ¼ | 3343.9 | 205.0 | ½ | 4128.2 | 227.7 |

| Diam. | Area. | Circum. | Diam. | Area. | Circum. |
|---|---|---|---|---|---|
| 72¾ | 4156.8 | 228.5 | 80 | 5026.5 | 251.3 |
| 73 | 4185.4 | 229.3 | ¼ | 5058.0 | 252.1 |
| ¼ | 4214.1 | 230.1 | ½ | 5089.6 | 252.9 |
| ½ | 4242.9 | 230.9 | ¾ | 5121.2 | 253.7 |
| ¾ | 4271.8 | 231.7 | 81 | 5153.0 | 254.5 |
| 74 | 4300.8 | 232.5 | ¼ | 5184.9 | 255.3 |
| ¼ | 4329.9 | 233.3 | ½ | 5216.8 | 256.0 |
| ½ | 4359.2 | 234.0 | ¾ | 5248.9 | 256.8 |
| ¾ | 4388.5 | 234.8 | 82 | 5281.0 | 257.6 |
| 75 | 4417.9 | 235.6 | ¼ | 5313.3 | 258.4 |
| ¼ | 4447.4 | 236.4 | ½ | 5345.6 | 259.2 |
| ½ | 4477.0 | 237.2 | ¾ | 5378.1 | 260.0 |
| ¾ | 4506.7 | 238.0 | 83 | 5410.6 | 260.8 |
| 76 | 4536.5 | 238.8 | ¼ | 5443.3 | 261.5 |
| ¼ | 4566.4 | 239.5 | ½ | 5476.0 | 262.3 |
| ½ | 4596.3 | 240.3 | ¾ | 5508.8 | 263.1 |
| ¾ | 4626.4 | 241.1 | 84 | 5541.8 | 263.9 |
| 77 | 4656.6 | 241.9 | ¼ | 5574.8 | 264.7 |
| ¼ | 4686.9 | 242.7 | ½ | 5607.9 | 265.5 |
| ½ | 4717.3 | 243.5 | ¾ | 5641.2 | 266.2 |
| ¾ | 4747.8 | 244.3 | 85 | 5674.5 | 267.0 |
| 78 | 4778.4 | 245.0 | ¼ | 5707.9 | 267.8 |
| ¼ | 4809.0 | 245.8 | ½ | 5741.5 | 268.6 |
| ½ | 4839.8 | 246.6 | ¾ | 5775.1 | 269.4 |
| ¾ | 4870.8 | 247.4 | 86 | 5808.8 | 270.2 |
| 79 | 4901.7 | 248.2 | ¼ | 5842.6 | 271.0 |
| ¼ | 4932.7 | 249.0 | ½ | 5876.5 | 271.7 |
| ½ | 4963.9 | 249.8 | ¾ | 5910.6 | 272.5 |
| ¾ | 4995.2 | 250.5 | 87 | 5944.7 | 273.3 |

| Diam. | Area. | Circum. | Diam. | Area. | Circum. |
|---|---|---|---|---|---|
| 87½ | 5978.9 | 274.1 | 93¾ | 6902.9 | 294.5 |
| ½ | 6013.2 | 274.9 | 94 | 6939.8 | 295.3 |
| ¾ | 6047.6 | 275.7 | ¼ | 6976.7 | 296.1 |
| 88 | 6082.1 | 276.5 | ½ | 7013.8 | 296.9 |
| ¼ | 6116.7 | 277.2 | ¾ | 7051.0 | 297.7 |
| ½ | 6151.4 | 278.0 | 95 | 7088.2 | 298.5 |
| ¾ | 6186.2 | 278.8 | ¼ | 7125.6 | 299.2 |
| 89 | 6221.1 | 279.6 | ½ | 7163.0 | 300.0 |
| ¼ | 6256.1 | 280.4 | ¾ | 7200.6 | 300.8 |
| ½ | 6291.2 | 281.2 | 96 | 7238.2 | 301.6 |
| ¾ | 6326.4 | 282.0 | ¼ | 7276.0 | 302.4 |
| 90 | 6361.7 | 282.7 | ½ | 7313.8 | 303.2 |
| ¼ | 6397.1 | 283.5 | ¾ | 7351.8 | 303.9 |
| ½ | 6432.6 | 284.3 | 97 | 7389.8 | 304.7 |
| ¾ | 6468.2 | 285.1 | ¼ | 7428.0 | 305.5 |
| 91 | 6503.9 | 285.9 | ½ | 7466.2 | 306.3 |
| ¼ | 6539.7 | 286.7 | ¾ | 7504.5 | 307.1 |
| ½ | 6575.5 | 287.5 | 98 | 7543.0 | 307.9 |
| ¾ | 6611.5 | 288.2 | ¼ | 7581.5 | 308.7 |
| 92 | 6647.6 | 289.0 | ½ | 7620.1 | 309.4 |
| ¼ | 6683.8 | 289.8 | ¾ | 7658.9 | 310.2 |
| ½ | 6720.1 | 290.6 | 99 | 7697.7 | 311.0 |
| ¾ | 6756.4 | 291.4 | ¼ | 7736.6 | 311.8 |
| 93 | 6792.9 | 292.2 | ½ | 7775.6 | 312.6 |
| ¼ | 6829.5 | 293.0 | ¾ | 7814.8 | 313.4 |
| ½ | 6866.1 | 293.7 | 100 | 7854.0 | 314.2 |

## MEAN RESULTS OF METALS.

*From experiments made by Maj. Wm. Wade, for the Ordnance Department, U.S., at the South-Boston Foundry.*

| KIND OF METAL. | Tenacity. | Transverse Strength. | Compression. | Torsion. | Specific Gravity. |
|---|---|---|---|---|---|
| CAST-IRON. Good Common Castings | 20,000 | 7,500 | | 7,000 | 7.180 |
| Good Iron from Gun-heads, Boston and West Point, 1848 and 1849 | 32,000 | | 105,000 | 9,000 | 7.280 |
| Gun-Iron, cast in small bars | 34,000 | 9,500 | 130,000 | | 7.320 |
| CAST-STEEL. | 128,000 | 23,000 | | | 7.846 |
| WROUGHT-IRON begins to yield, taking a permanent set | 31,000 | 6,500 | 40,000 | 3,600 | 7.855 |
| Ultimate strength | 57,000 | | | 7,700 | |
| Bends and endures without breaking | | | | | |
| BRONZE begins to yield, taking a permanent set | 19,000 | | 116,000 | 2,300 | 8.710 |
| Ultimate strength | 42,000 | | | 5,500 | |
| Bends and endures without breaking | | | | | |

### TESTING THE STRENGTH OF IRON AND OTHER METALS.

By means of the accurate instrument designed and constructed by Major Wade, we can determine the capacity of any metal to resist a *transverse*, *tensile*, and *torsional* pressure. Specimens furnished us of suitable size — say two inches and over — will be turned down to the size adapted to the instrument, and the result, together with the density, made known at short notice.

G

*Weight of Cast-Iron Pipes of Different Thicknesses, from one inch to thirty-six inches bore, and one foot in length.*

| Bore. | Thickness | Weight. | Bore. | Thickness | Weight. |
|---|---|---|---|---|---|
| Inches. | Inches. | Lbs. | Inches. | Inches. | Lbs. |
| 3 | $\frac{3}{8}$ | 12.28 | 10 | $\frac{3}{4}$ | 78.99 |
|   | $\frac{1}{2}$ | 17.15 |   | $\frac{7}{8}$ | 93.24 |
|   | $\frac{5}{8}$ | 22.15 |   | 1 | 108.84 |
|   | $\frac{3}{4}$ | 27.56 | 12 | $\frac{1}{2}$ | 61.26 |
| 4 | $\frac{1}{2}$ | 22.05 |   | $\frac{5}{8}$ | 77.36 |
|   | $\frac{5}{8}$ | 28.28 |   | $\frac{3}{4}$ | 93.70 |
|   | $\frac{3}{4}$ | 34.94 |   | $\frac{7}{8}$ | 110.48 |
| 5 | $\frac{1}{2}$ | 26.94 |   | 1 | 127.42 |
|   | $\frac{5}{8}$ | 34.34 | 16 | $\frac{1}{2}$ | 80.87 |
|   | $\frac{3}{4}$ | 42.28 |   | $\frac{5}{8}$ | 101.82 |
| 6 | $\frac{1}{2}$ | 31.82 |   | $\frac{3}{4}$ | 123.14 |
|   | $\frac{5}{8}$ | 40.56 |   | $\frac{7}{8}$ | 144.76 |
|   | $\frac{3}{4}$ | 49.56 |   | 1 | 166.60 |
|   | $\frac{7}{8}$ | 58.96 | 18 | $\frac{5}{8}$ | 114.10 |
| 8 | $\frac{1}{2}$ | 41.64 |   | $\frac{3}{4}$ | 137.84 |
|   | $\frac{5}{8}$ | 52.68 |   | $\frac{7}{8}$ | 161.90 |
|   | $\frac{3}{4}$ | 64.27 |   | 1 | 186.24 |
|   | $\frac{7}{8}$ | 76.12 | 20 | $\frac{5}{8}$ | 126.33 |
|   | 1 | 88.20 |   | $\frac{3}{4}$ | 152.53 |
| 10 | $\frac{1}{2}$ | 51.46 |   | $\frac{7}{8}$ | 179.02 |
|   | $\frac{5}{8}$ | 65.08 |   | 1 | 205.80 |

| Bore. | Thickness | Weight. | Bore. | Thickness | Weight. |
|---|---|---|---|---|---|
| Inches. | Inches. | Lbs. | Inches. | Inches. | Lbs. |
| 22 | $\frac{5}{8}$ | 138.60 | | | |
| | $\frac{3}{4}$ | 167.24 | | | |
| | $\frac{7}{8}$ | 196.46 | | | |
| | 1 | 225.38 | | | |
| 24 | $\frac{5}{8}$ | 150.85 | | | |
| | $\frac{3}{4}$ | 181.92 | | | |
| | $\frac{7}{8}$ | 213.28 | | | |
| | 1 | 245.08 | | | |
| 30 | $\frac{3}{4}$ | 226.20 | | | |
| | $\frac{7}{8}$ | 264.79 | | | |
| | 1 | 303.86 | | | |
| | $1\frac{1}{8}$ | 343.20 | | | |
| 32 | $\frac{3}{4}$ | 240.76 | | | |
| | $\frac{7}{8}$ | 281.94 | | | |
| | 1 | 323.49 | | | |
| | $1\frac{1}{8}$ | 365.29 | | | |
| 34 | $\frac{3}{4}$ | 255.45 | | | |
| | $\frac{7}{8}$ | 298.88 | | | |
| | 1 | 342.88 | | | |
| | $1\frac{1}{8}$ | 387.13 | | | |
| | $1\frac{1}{4}$ | 431.76 | | | |
| 36 | $\frac{3}{4}$ | 270.18 | | | |
| | $\frac{7}{8}$ | 316.36 | | | |
| | 1 | 362.86 | | | |
| | $1\frac{1}{8}$ | 409.34 | | | |
| | $1\frac{1}{4}$ | 456.46 | | | |

NOTE. — These weights do not include any allowance for spigot, faucet, or flanch ends.